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IS BLACK TONGUE OF DOGS IDENTICAL WITH PELLAGRA OF MAN?

In the U. S. Public Health Reports for February 19th, Drs. Joseph Goldberger, G. A. Wheeler, R. D. Lillie and L. M. Rogers of the U. S. Public Health Service, give the results of a further study of butter, fresh beef and yeast as preventives of pellagra in man and of black tongue in dogs.

They found that fresh lean beef and yeast contain a factor, which they designate "factor P-P," that probably plays the primary role in the prevention of pellagra.

Regarding black tongue of dogs, the following is quoted from the report:

"It seems necessary at this juncture to anticipate the publication of the results of our experimental study of black tongue of dogs. This study, begun over four years ago, is still in progress, but we may now state that we have experimentally induced this canine disease by feeding dogs certain diets previously found associated with the occurrence of pellagra, including the Rankin prison farm experimental diet. In this study, white and yellow maize meal, casein, cod liver oil and butter have been found very poor, or lacking, in the black-tongue preventive factor. Milk has been found to possess inferior preventive activity. A test of fresh lean beef, although not yet completed, is sufficiently far advanced to warrant the statement that this possesses considerable black-tongue-preventive potency. Dried yeast and the commercial yeast extract have been found very efficient preventives of black tongue. Seidell's activated solid in a daily dose at the rate of 2 grams per kilo of body weight as a supplement to basic diet 123, has black-tongue-preventive action. Thus the black-tongue-preventive factor is present in lean beef muscle, in yeast, and in the commercial dried watery extract of yeast, and it is adsorbed from a watery extract of yeast by English fullers' earth. Our data appear to indicate that this factor is a dietary essential, heretofore either not recognized or not appreciated as such, necessary for the nutrition of the dog.

"It appears that the substances that have been found to possess black-tongue-preventive potency have, when tried in pellagra, been found efficient preventives of the human disease; those that had failed in pellagra or were of low pellagra-preventive potency (milk) when tried in black tongue, have failed or were feeble as preventives of the canine syndrome. In view of this striking similarity, if not identity, of behavior, we feel justified in adopting, and are planning our studies of pellagra on the working hypothesis that black tongue of dogs is the analogue of pellagra in man. Accordingly, it may tentatively be assumed that factor P-P is the dietary essential primarily concerned in the prevention and causation of both black tongue and pellagra. The assumption of this identity seems all the more reasonable as otherwise it would (and it still may), be necessary to conclude that the "yeast vitamin" powder contains in addition to the pellagra-preventive essential, also a special black-tongue-preventive factor."

Recent studies completed by the United States Department of Agriculture on the comparative yield of cows milked twice a day and those milked three times a day will no doubt be viewed by the farm boy and the hired man with the feeling that some one is always taking the joy out of life. The department's milkers have found that milking three times a day produces more milk than twice-a-day milking. In fact, over a short period the increase in production is 12.5 per cent, while over a long period it appears

that this increase is even greater. It was noted that cows milked three times a day hold up better near the end of the lactation period than cows milked twice a day. The economy of three-times-a-day milking has not yet been accurately estimated, but it will depend upon several factors, chief of which are quantity of production, cost of labor, and value of product.

INCOMPETENT VETERINARY SERVICE

The following is quoted from the Oklahoma Live Stock News (Oklahoma City) of February 18th:

"Certificates, licenses, diplomas, degrees etc., exhibited as a badge of competency fall on deaf ears when it comes to A. N. Dressen now when he employs veterinary service. This Seward, Okla., pure bred breeder paid a-plenty for his experience in finding out that all that glitters is not gold, when it comes to employing a veterinarian. His experience goes along lines as follows:

"Mr. Dressen lost a young animal from what he thought was blackleg. To prevent further spread of the disease he called in a practitioner from another town and had all of his young pure-bred cattle vaccinated. When the practitioner came he commenced cutting twine string. Mr. Dressen asked him what he was going to do with the strings and was assured that it was easier to vaccinate in that way. The practitioner then cut a hole in the brisket of each animal to be vaccinated, put some "dope" on the string, then put the string through the hole in the brisket and tied it tight. In a short time trouble was evident and before Mr. Dressen could check it by really competent veterinarians, he had lost eight head of cattle six of which had been appraised by neighbors before the last two died at $550. The last two that died were equally as valuable as any of them, so it is an easy matter to figure up how much Mr. Dressen's incompetent veterinary service cost him.

"The veterinarians who examined the cattle that died and treated those that had been vaccinated but which were still alive, reported it was positively shown that blackleg arose from the point where the incompetent practitioner administered what was to be a preventive of blackleg. In other words instead of vaccinating the animals against blackleg he gave them blackleg. Mr. Dressen in his effort to make his young cattle safe from blackleg actually had them inoculated with blackleg, and so paid a fearful price not only in monetary losses but also in the loss of breeding animals which were almost invaluable in his herd. Several of the young bulls died that he intended to sell in the Hereford list at the Southwest American Show this week. The report of the veterinarians called in for consultation also shows that the only r e a s o n why Mr. Dressen did not lose the other animals was probably because of the natural immunity against the disease and the re-vaccination with aggressin.

"Stockmen generally over the state will sympathize with Mr. Dressen and will hope that the day is not far distant when the stockman who wishes to protect his herd from blackleg will not suffer such losses."

Five hundred white rats are being given intelligence tests to determine learning ability with respect to age in the Stanford University laboratories of psychology. The study is being financed by a grant from the Carnegie Corporation of New York of $12,000 to be extended over a period of three years. After the first year higher animals, such as the cat, will be studied.

The problem in the case of animals, according to Professor Calvin P. Stone, who is conducting the experiments, is to test the ability to learn at successive stages of development. With rats, ages of 20, 30, 50, 100 and 200 days are used. Intermediate ages may be used later in further expansion of the work. Both the learning of new habits and the breaking of old ones are to be tested.

A rough estimate of the relative rate of physical development in the rat and in man would be about 30 to 1. A rat one month old is equal in physical development to a child two and one-half years old. Results now at hand would seem to indicate that the

ratio of mental development is probably more nearly 50 to 1, according to Professor Stone.

STATEMENT OF OKLAHOMA ASSOCIATION ON INCOMPETENT PRACTITIONERS

The Oklahoma State Veterinary Medical Association makes the following statement in reference to the article published February 18 in the Oklahoma Live Stock News regarding the loss by a Logan county breeder due to incompetent service rendered by a so-called veterinarian.

In reply to an article appearing in the Feb., 18, issue of the Oklahoma Live Stock News under the caption "VETERINARIAN IS THE CAUSE OF LOSS." We appreciate the fairness of the attitude of this article to the veterinary profession but we do keenly desire the public to have a clearer understanding of what we term veterinary service.

Laws are Inadequate

In order to explain, it will be necessary to recite a little history of the state of Oklahoma. Prior to the year 1913 the laws of this state contained nothing to define a veterinarian. During the year 1913 a veterinary law was enacted. The Oklahoma State Veterinary Association presented to the legislature a bill which would have allowed only qualified veterinarians to practice in the state. In lieu of this bill, a substitute was passed allowing three hundred and fifty non-graduate men and fifty graduate men to register and serve the public in the field of veterinary service. Understand the above mentioned association, consisted only of men who had graduated from recognized schools and who did not and do not recognize these non-graduate men as veterinarians. As a body of school men in our profession we object to being classified with those who are in pure and simple terms "quacks". Call us what you please, horse doctors if you please (certainly a doctor who doctors a horse is a horse doctor) but please do not put us in the same sack with these quacks, shake us up and call us veterinarians. We acknowledge that among these three hundred and fifty non-graduates there are some good practical men, but on the other hand a very large majority are of the caliber of the man alluded to in your article of February 18. Men, who supplied the lost cud to the cow, treated wolf in the tail, hollow horn, allowed their instruments to remain coated with blood and pus, and scoffing at serums and vaccines, are the pure de-quacks and a menace to any community. We are advised that the man referred to is not even one of the three hundred and fifty registered men, that he is not a licensed man. He does not stand alone, there are many of his class preying on the public today. The case recited is not an exceptional case. We daresay there is not one community in the state that cannot relate cases of malpractice reflecting as vividly this ignorance and carrying just as fearful a toll of death in their wake.

Ol' Hoss Doc

It is only natural that a certain part of the public has in mind that early picture of the "Hoss Doctor." That picture of the old livery barn (now practically extinct). You recall the man, usually a large man with a flowing Dan McGrew mustache, complexion florid, nose blossomed, chin prominent(chiefly due to stain of tobacco) clothes nicely greased (tinted here and there by various nostrums, blood specks) boots suggestive of the barnyard. You recall his apartment in the rear of the barn, his tools, his bottles and ropes, various odors of a distinctive offensive nature. Surely you have not forgotten his bluster, punctuated by profanity, boasting, that he came from the school of experience. Why, why associate him with the veterinarian of today?

Cooperation Asked

This is not the first and probably will not be the last of such experience as referred to in your article. Our association of veterinarians, graduates from recog-

nized colleges, men who devote their lives to this profession regret the disaster which comes from such illicit practice and that is what we call quackery in veterinary service.

We have and will continue to appeal to the law-makers of the state of Oklahoma to pass such legislation necessary to protect stockmen and farmers from this form of malpractice and we sincerely ask the co-operation of stockmen in bringing about a condition which protects them as well as the recognized veterinary profession and is an economic need now more than ever before. —Oklahoma Live Stock News.

ABORTION INFECTED MILK SAFE FOR CALVES

The following item appeared in the Rural Press, San Francisco, Cal., February 13th:

"That it is safe to feed milk from cows that have aborted to calves has been determined by Dr. Geo. H. Hart and Gladys M. Woods of the University.

"The calves that were used in the experiment were all born to cows in the abortion experimental herd maintained by the Division of Veterinary Science. Not only did these calves get milk from infected cows but large doses of a virulent strain of abortion organism was added to the milk before feeding to make sure that each calf got a liberal ration of 'bugs'.

"Some of these calves were killed as the experiment went along, an examination made and tests made on guinea pigs to demonstrate just what had taken place.

"In all calves killed shortly after getting the infected milk the organism was present, but it was found that when a few weeks had elapsed the organism was rarely found. Dr. Hart is of the opinion that after 6 or 8 weeks have passed after the calf has had infected milk no organism will be found.

"The calves that were not killed were weaned at 6 months of age. Eleven of the heifers were allowed to reach breeding age. Ten of the heifers carried their calves to maturity. One was lost prematurely but not through contagion. Blood test of these heifers showed that they were free from the germs of contagion."

PROGRESS MADE IN RESEARCH ON CANINE DISTEMPER

In the February issue of The Veterinary Journal (London), appears a communication from officials of the Field Distemper Fund, reporting progress in the research work on canine distemper, which was begun February 1, 1923.

To quote from the report:

"The source of distemper has been proved to be an invisible, extremely minute organism or virus capable of passing through filters that will hold back all ordinary microbes or bacteria. Though this virus cannot yet be grown or propagated in a test-tube, it has already been stored by appropriate methods for over a fortnight. Though our observers are not yet satisfied in every detail of their proof, they are already well on the way towards bestowing immunity from distemper upon ferrets, animals which are particularly susceptible to the disease; and this, of course, is the first step towards giving immunity to dogs themselves.

"The whole of this advance has been made in the last eighteen months. For a year and a half before that, we were consolidating our plans, assembling our staff, breeding puppies, making the necessary preliminary observations, and building kennels and other essential isolated constructions, better fitted for their purpose than anything of the kind existing elsewhere, at a cost of about 10,000 Pounds. Nearly all that sum represents a non-recurrent expense involving solid and lasting assets. We must, however, face, in addition, a considerable yearly sum for upkeep, salaries and other necessities, which will only be possible if those who have helped us before continue their assistance, and those who have not yet sent their contributions to our bankers, Messrs. Coutts & Co., 440 Strand, immediately proceed to do so. Including the donations of our American Committee, we have a clear balance in hand of over

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5,000 Pounds; and our printing and clerical services have been undertaken by the Field without charge to the Fund, at a cost of nearly 400 Pounds. If our friends continue to support us only at the average rate at which they have hitherto subscribed, we may feel confident that the 25,000 Pounds originally estimated as the final cost of our research will be forthcoming."

Hemorrhagic septicemia aggressin and aspirin are recommended as curative agents in canine distemper.

Some practitioners are enlarging their scope of usefulness and increasing their income by testing chickens for pullorum infection.

The virus of rabies may occur in the saliva from 6 to 8 days before symptoms are manifested.

The first case of rabies that was recognized in America occurred in Boston in 1768.

It has been estimated that about 1/10th of the graduate veterinarians in the United States are engaged in tuberculosis eradication.

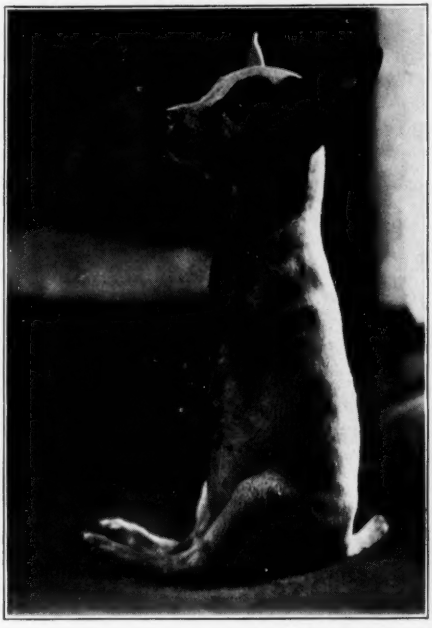
Heart disease ranks first in the United States as a cause of death in the human. The death rate from heart disease is increasing.

Abortion disease of cattle is an infection manifested by one or all of the following conditions: abortion, retained placental membranes, metritis, mastitis, sterility and in many cases there is pneumonia and scour in calves.

The veterinarians in Tulsa, Oklahoma, are cooperating with the dog owners and health officials in the control of rabies. The dog tax has been reduced to $1.50 and a license is issued upon the presentation of a vaccination certificate. The veterinarians are vaccinating dogs with the single injection rabies vaccine for $1.50.

There are approximately 186,000,000 acres of grazing land in eleven western states. A considerable portion of this land is in Federal forest reservations. A small fee is charged for grazing privileges in forest reservations.

The successful control of infective diseases is dependent upon a knowledge of the location of the infection in the diseased animal, the avenues through which the infection is eliminated and the avenues through which the infection can gain entrance and produce disease in exposed animals.



Two-legged dog "Nellie," reported by Dr. P. W. Horner of Elkhart, Ind., who states this animal was born October 19, 1925, being one of a litter of four Fox Terriers, two males and two females. The males were normal, but the females were both born without front legs. Nellie's little sister died when two days old, but Nellie is very much alive at four months of age. She propels herself in kangaroo fashion, using the two hind legs, aided by her tail.

Practitioners should not lose sight of the fact that they should be the source in their respective communities of information relative to the various problems of breeding and feeding of all farm animals as well as treating the sick and afflicted and controlling infections.

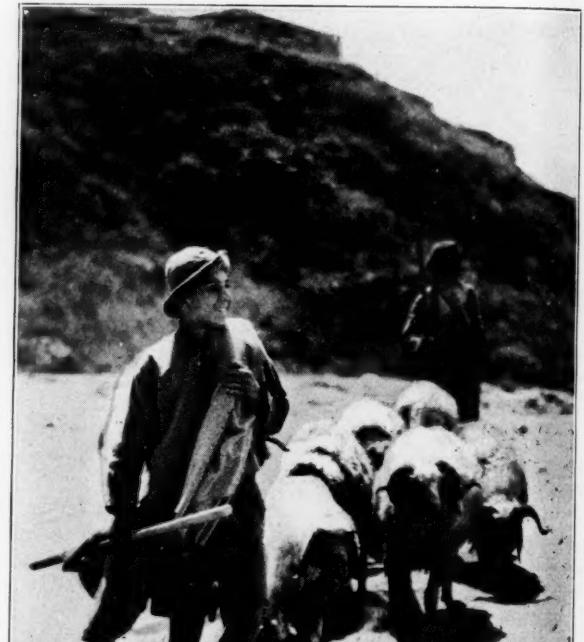
"The blood serum of cows which have acquired infectious abortion may react strongly to the agglutination test for at least a year after the disappearance of the infection from the udder, as indicated by guinea pig inoculation tests." Buck & Creech.

Cattle breeders are beginning to appreciate the danger in buying non-reacting cattle from tuberculous herds, for some breeders have found that non-reactors from infected herds may at a later date become positive reactors and cause endless trouble and expense.

Canine distemper is one if not the most important and fatal disease of dogs in America. Curs are not as subject to the disease as well bred dogs. It has been estimated by dog fanciers that not more than 50 per cent of the puppies of some breeds survive because of distemper.

"In cases of calf pneumonia, good results have followed the use of calf pneumonia bacterins. Especially have such procedures resulted favorably when the organisms causing the infection on the particular farm are used in the bacterin. When pneumonia tends to develop in calves recovered from scour, these bacterins should be given as soon as the animals are safely out of danger from the diarrhea." Hart and Traum.

Hogs are approximately $3.00 per hundred higher now than they were one year ago. Cattle and sheep are $2.00 higher than they were at this season in 1925. With the increased price of marketable swine, sheep and cattle the surplus corn can be profitably fed.



(Photo by Adelbert Bartlett)

Shepherds with horned sheep at Jebeil, Syria.

Nephrectomy in Bovine Practice

H. E. BEMIS, Surgery Department, Iowa State College, Ames, Iowa

Pyelonephritis seems to be quite common in cows as our clinics have contained four cases in the last three years. The condition seems to be identical with the condition discussed under this heading in Hutyra and Marek, volume 1, page 1089. The symptoms, lesions and causative agent in our cases have been identical with those described in the text and for that reason will not be discussed here. On February 25, 1925, a Holstein cow, eight years old, was presented at the clinic for diagnosis and treatment. The symptoms were as follows: pulse 72, respirations 32, temperature 102.6. Animal emaciated, hidebound and in weakened condition. The most marked external symptom was the frequent passage of small amounts of dark colored urine which contained pus and mucus. The specific gravity was 1010, acid in reaction, albumin and sugar absent. Bacteriological examination made by Dr. Rice revealed streptococci and the Bacillus renalis of bacterial pyelonephritis.

Rectal examination revealed the left kidney greatly enlarged, left ureter enlarged to about one inch in diameter, bladder small and thick walled. So far as we could determine the left kidney only was involved. Inasmuch as our previous experience with such cases had been that death invariably resulted if the disease was allowed to run its course, we decided to attempt removal of the infected kidney. The technic for the operation is as follows:

Thoroughly prepare by shaving the entire left flank of the animal and paint the skin with tincture of iodin. Administer 1½ to 2-ounces of chloral hydrate in warm solution given as a drench 20 to 30 minutes before operating. Secure the animal in standing position against the operating table or side wall and anesthetize the line of incision with any of the standard local anesthetics. Make an incision 12 to 14 inches in length in the middle of the triangular area bounded by the posterior border of the ribs, the external angle of the ilium of the transverse processes of the lumbar vertebrae. The incision should be carried through the skin and subcutum and the external and internal oblique muscles. The transversus is then divided in the direction of its fibers and the peritoneum divided in the same direction and to the same extent. Hemorrhage should be controlled before proceeding, particularly at the point where the circumflex iliac vessels are crossed. This provides sufficient room so that the operator can work within the peritoneal cavity with both hands whenever necessary.

The kidney is located by palpation and the parietal peritoneum overlying it is divided longitudinally and removed from the surface of the kidney by blunt dissection with the fingers. When this has been done the kidney hangs in a more or less pendulous manner suspended anteriorly by the renal artery and vein and posteriorly by the ureter. Pass the fingers entirely around the vessels which can be identified by the pulsation of the artery and the thin walled fluctuation of the vein and carry around these vessels a long silk ligature or heavy catgut ligature, size No. 4. The ligature should be long enough so that the knot can be tied outside of the abdominal wall and then carried in and made tight by the use of the two hands carrying the knot in upon the vessels. After the ligature has been made secure as near the origin of the vessels as possible, ligate them at another point as near the kidney as possible. Clamp on a pair of compression forceps between the two ligatures and cut the vessels along the distal edge of the forceps. When this has been done release the forceps slowly until they can be entirely removed if no hemorrhage takes place. If hemorrhage should take place, close the forceps again and put on another ligature above them. The forceps are used merely as a safeguard against losing the ligated stump until one is sure that the ligature is tight enough to prevent

hemorrhage. Next, further isolate the kidney and trace the ureter as far posteriorly as possible, at which point it is then ligated in two places and divided between the ligatures. The proximal ligature will prevent the escape of purulent material from the kidney into the peritoneal cavity and the distal ligature will prevent the escape of material from the remainder of the ureter. The stump which remains should be cauterized or thoroughly disinfected with tincture of iodin. The kidney is completely removed as soon as the ureter is divided.

The line of incision in the parietal peritoneum in the region of the kidney should be sutured with catgut and the abdominal wall closed in the usual manner which includes very careful apposition of the parietal peritoneum followed by suturing the divided muscles to eliminate spaces and finally suturing the skin and applying a collodion dressing.

After this operation, which was performed on March 2, 1925, the animal improved noticeably in appetite and general condition and in the condition of the urine. She was discharged from the hospital on March 23rd. The owner reported that she seemed to be making progress until about the second week in April. She was examined on April 18th, at which time we found that a similar process was beginning to involve the right kidney, and all of the symptoms which the cow showed originally were returning. The animal died on April 27, 1925, and the autopsy showed an extensive involvement of the right kidney and ureter, which of course resulted in the death of the animal. The wound healing in the region from which the left kidney had been removed was complete and the stump of the left ureter was completely closed. I am reporting this case for the purpose of giving the technic for the removal of the kidney as it was performed in this case. So far as the operation itself is concerned, it seems to be entirely possible to remove the kidney without any immediate after affects and I am certain that it would be a useful operation in any case where but one kidney is involved. The operation has been performed in our ambulatory clinic by Dr. F. E. Walsh with the same results as reported in this case.

The death rate from typhoid fever has been reduced from 35.9 per 100,000 in 1900 to less than 7 per 100,000 in 1924. This reduction in typhoid fatalities has been largely due to a comprehension of a clean water supply and an efficient dairy inspection.

Thumping, cough, unthriftiness and digestive disturbances in pigs from one to six weeks of age are the usual symptoms of pulmonary ascaridosis. The lesion typical of this malady is embolic pneumonia. Treatment of this malady is of little value. Proper sanitation combined with proper cleansing of the sow prior to farrowing effectually prevents this condition.

Several cases of tularemia occurred in Kansas City, Mo., during December, 1925, and January, 1926. These cases establish a new center of tularemic infection. It is apparent that the disease is quite widespread in rabbits and probably occurs frequently in the human and is not recognized.

Anthrax control is an important problem in the Mississippi Delta. This disease was widespread and very fatal in 1924, when it was found that the usual simultaneous vaccination with spore vaccine and anti-anthrax serum was inadequate in protecting mules against the infection. Special vaccines were used but the results were not universally satisfactory. The disease was not as prevalent and was less fatal in 1925.

The Veterinarian's Standing in His Community*

R. L. RHEA, San Antonio, Texas

Veterinary practice in all its phases has become of age. It is about through standing around like an overgrown boy apologizing for its existence. It has been given a haughty stare for many years, but now it has passed from the stage of a chrysalis and finds itself with full grown wings. In other words, the world has realized the importance of the calling, and it is quietly assuming a dignity which is its due with no apologies for its existence.

The time is past when it is generally recognized that education is not necessary for a veterinarian. In fact, great schools are established for the training of capable veterinarians. We have realized that a broad basis of general culture is as necessary for a successful veterinary practitioner as for any other profession. Indeed, the veterinary profession has become of age.

We have heard much talk during recent years which has caused some of us to wonder whether our profession is on the decline and what its future is to be. With this in mind we may well ask ourselves the question, what sort of a superstructure are we as veterinarians going to rear upon the foundation already laid? Meanwhile it may not be amiss for us to speculate on it, and with this in view, I venture to offer four cornerstones which we may lay for a veterinary superstructure of practice.

The first cornerstone I would suggest is work. One of the most serious of all professional ills is a constitutional aversion to work. I am wondering if the diseases in our professional body today are not to a great extent due to this fact. Let us be fair and admit that men of all professions sometimes slight their tasks and that the good old fashioned truth seems to be this—too many of us are trying to get by without honest-to-goodness work. Under this head, we can include service about which we hear so frequently nowadays.

We all have ideals in mind for our profession, and I do want it to have some definite, practical conception of service and put that conception into practice, but there is also the other side to consider. I would not recommend a service wholly free from compensation. Every service in life worth while has its compensation. Remember all service in our professional life is not confined to that rendered to our clients. Make yourself an asset to your community. How many of us are called upon to assist personally in civic movements in our communities? How many of us take active parts in church and civic club life? Always identify yourself with the best that is in your community.

Bacon's conclusion was, "Knowledge is power." This applies to all business. Keep widening your scope of knowledge. The man who has a store of knowledge that applies to other lines than his own is attractive to men, and thus friendships are formed. A man's life is measured by his friendships, and our power to give and to get are each measured by our capacity to make friends. All this is acquired by steady persistent work.

Occasionally we find those who are content to gather the crumbs that fall from the table of intelligence. All members of our profession are invited to be full-fledged guests and sit at the table of intelligence, receiving the good things in store for those who apply honest work to their preparation and render sincere, efficient service, for which the greatest

* Presented at Texas State Veterinary Medical Association meeting, Jan. 20, 1926.

compensation will come. It is my belief that the establishment of good will is the essence of public relations and that we can secure good will only in proportion to the service we render.

The second stone in this structure I would suggest is square dealing. All of you recall the old saying "Experience is a good teacher." But let me add that experience keeps a school in which the tuition is very high, although it seems most of us learn some important lessons in no other way. My purpose here is to suggest the necessity of our developing a character in our dealings with our fellowmen. It is not what we have but what we are that counts. Eliminating the fact that a man is lazy, there can be but one reasonable cause for neglect of duty to our clients, and that is the veterinarian is not in love with his work.

There is truth in Carlyle's statement that only two things are necessary for a successful life; namely, "to find one's work and to do it." "What shall I do," asked Dean Stanley. Carlyle answered, "Do your best." This truly done, our dealings with our clients will be entirely satisfactory, and we shall never be crowned with unpleasant epithets. There is a saying that the wicked flee when no man pursues, but they make better time when the dissatisfied client is hot-footing it after them.

When our dealings are fair and square, our services honestly rendered from an honest professional standpoint, we shall have no desire to dodge but shall be glad to face any man and thereby reflect credit on our profession and the character of the men in its ranks.

The third supporting stone in the structure as I have outlined it is tolerance—tolerance of the fellow practitioner, his ideas and his relation to the same community. We are all friendly in this association; we are friendly with the man in the next town; but with the man with whom we meet daily, are we friendly? This professional criticism so prevalent has an effect on the cohesive force of our profession. We speak of iron as being hard—that fact is due to the cohesive force of its molecules—there is no friction between them. So with us as professional men—without friction, without strife, backbiting and kindred ills, our professional body is strengthened in our community, in our state and in our nation.

As members of a profession, we must distribute honors where honors are due. We claim to be honest men, and if so we should distribute evenly all the strawberries through the box and not thrust ourselves into the sun while we thrust a fellow veterinarian into the shadow.

The fourth stone in this structure is unselfishness. No man can live unto himself in any line of business. The man who limits himself to a narrow few, limits his capabilities just that far. We must receive money for our services, we must provide for a rainy day and inevitable old age; but we should put something into life and our profession and not be parasites, extracting vitality from a host and contributing nothing to its support.

We are next door to everybody today, and our professional life is known where we do not think. So let it be said of us that we played the game according to the rules, like sportsmen and made our profession better by our having been in it.

Here, then, is our veterinary superstructure built on the four cornerstones of work, square dealing, tolerance and unselfishness.

Youth is a period of prejudice, of bigotry, of assurance, but now as our profession has become of age, we should act wiser and our schools should be broader in their scope of education. The men of this age must be trained men. It will not do to enter the professions today where competition is so close and general education so high, without the fullest preparation. I do not hesitate to say that the leaders of tomorrow in our profession will be university men trained in veterinary medicine, sanitary science, animal husbandry and agriculture.

I am hopeful for our profession. I

know it has not reached its zenith. I am confident of its future in view of the courage, intelligence and morale of the men who are among its rank and file today.

White Scours or Infectious Diarrhea in Calves

J. F. DeVINE, Goshen, N. Y.

I SHOULD LIKE some information to help me get rid of scours in a herd of registered Jerseys that I have been treating for some time. The calves are carried full time and when dropped are as strong, rugged calves as any but within ten or twelve hours they develop scours and within twenty-four to thirty-six they die.

I have injected them with all proportions of serum from ten to thirty c.c. as soon as they were dropped and have repeated in ten hours but still they died. Then I gave them the same injection and a small tablet of sulpho-carbolates. That was no better. Then I gave the serum and tablet and a mixture containing a small amount of opium but with the same result. I have ligated the cord as soon as dropped and painted with iodin or when I could not get there for an hour the owner has done it. The serum has been injected the same way. There has been no waiting a number of hours before treatment began. The stable, a new barn, has been disinfected and a platform made so the cows are not moved to the usual stall to calve as I thought the calves might have gotten infected there. The calves are put in a new stall where there never was a cow but they are just as bad. Last week two calves were born the same day and I was there when they came and both were injected with thirty c.c. of Mulford serum. In eight hours one started to scour and was given thirty c.c. more and the other twenty c.c. Within fourteen hours the first was dead and the other scouring. The owner gave this one some patented medicine and it is still alive although he gave several doses.

This herd has never had contagious abortion and it is very seldom that a cow slinks her calf. Out of forty-two animals bred or ready to breed in a year, there have been only two abortions and of those the cause was of a different nature.

If there is any medicine or anything else that I can do I should be very glad to get the help as the owner is disgusted with the results from serum as we have used a considerable amount.

F. G. R.

Being in a dairy district I have for years been forced to take an acute interest in this problem. At the time I took up the practice of veterinary medicine, the writers on this subject in dealing with the channel of infection were either silent or quoted the conclusions of Nocard, that white scours in calves was transmitted chiefly, if not solely, through the umbilical wound. After a few years in practice my observations led me to doubt this theory. In the year 1903 I saw more of this trouble in my community than I have seen in all the years that have followed. It seemed as if every client owning a dairy appealed to me for relief from this destroyer. After instituting every known form of strict sanitation so as to protect the umbilical cord from external infection, the trouble still continued. In addition to sanitation of the stalls I decided to eliminate positively external umbilical infection in some herds near my office, by either being present myself or having a reliable assistant present, at the time of parturition. I had the fetus caught in a clean sheet and the umbilical cord tied with a sterile ligature, reaching into the

genital canal to do so in some cases so as to ligate before cutting or breaking the cord; this failing I then decided the digestive tract was the point to protect, and the results obtained which I shall discuss under "Control and Treatment," have proved conclusively to me that while umbilical infection may be one source of transmission and the swallowing of the amniotic fluid in utero may be another, the overwhelming majority of cases are due to infection through the digestive tract, and that after the calf has been dropped, and not in utero.

Some associate white scours and abortion while other very reliable workers question very positively that there is any common alliance between abortion and white scours, but that they are two distinct etiological entities. Schroeder is one of our authorities who holds this view and in a communication received from him some time ago, he gives me the following data of experimental evidence gathered at the federal experiment station at Bethesda, Md.

"At the station we have had much abortion disease and many abortions, but we have not had a single case of white scours, notwithstanding that we have had many calves of healthy cows under observation which were given abortion infected foster mothers, and many calves of abortion infected cows which were given healthy foster mothers."

While it is a fact that in some herds in which abortion disease is raging, we often have many cases of udder infection and not infrequently in such herds many of the calves that are carried to or near the end of a normal gestation period, develop a highly virulent form of white scours, it is likewise true that we may and do have in herds severe abortion without the slightest evidence of white scours. Conversely we may have infectious scours with no prominent evidence of abortion disease.

I could give voluminous data of heifers aborting, the offspring of dams that never aborted; and conversely of heifers from aborting dams that never aborted when either removed from the infected herd or when kept in the same herd after strict sanitation had been carried out.

Symptoms

White scours or infectious diarrhea in calves is an acute infectious disease of the newly born calf. The symptoms, which may appear from a few hours to many days after birth, are manifested by a persistent white and frothy diarrhea and loss of strength, the mortality ranging from 50 to 90 per cent. Death may occur during the first twenty-four hours, or the disease may run a course of several days or weeks, terminating either in recovery or death, with pulmonary lesions. Calves that succumb the first day are usually those that are weak and undeveloped.

With stronger calves frequently the first indications are that the calf ceases to feed, stands in one place with its back arched, and a staring look; or it may be very much depressed and lie down a great deal of the time. Diarrhea ordinarily appears early as a symptom; the material is very fluid, at first yellowish, later grayish white in color; frequently frothy containing lumps of clotted milk and not infrequently blood streaks. The odor is described as being peculiarly sweetish and putrid. The parts around the anus are soiled and the hair matted. The calf loses flesh rapidly, the flanks are hollow, eyes sunken, hair dull, often lying listlessly with occasionally grating of the teeth, the nose is hot and dry, the temperature elevated. As the disease progresses the body may become cold and clammy and the temperature subnormal. In some animals violent straining hurries on rapid exhaustion. In severe cases exhaustion is sometimes so complete as to border on coma for a time preceding death. In some cases the animal bloats considerably causing pain and uneasiness by pressure on the abdominal walls. In cases where the infection is apparently milder or the calf more resistant and the disease is manifest in a more chronic form, articular or pneumonic symptoms may be pronounced.

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Control and Treatment

Finding that all efforts directed at the prevention of umbilical infection failed, I had maternity stalls prepared by thorough disinfection, the floors limed and newly bedded. All animals that had the appearance of calving within a week or ten days were thoroughly scrubbed with soap and disinfectant and covered with two blankets until they had dried, then transferred to the maternity stalls or to the section of the barn prepared for them. The cows were taken from these stalls daily and udders and hindquarters thoroughly scrubbed with soap and warm water and their vaginas douched with a douching powder that has proved the most satisfactory of anything I have used. This powder is made up of sterilized sodium chlorid and permanganate of potash. This treatment was continued until the cow freshened.

As soon as she freshened the first milk was drawn with the hope of removing the infected milk lying in the wells before the calf was allowed to nurse. There is no danger of removing all colostrum by such milking since this substance is present in the udder of the new milch cow for several days. The calf was then allowed to nurse and when finished was separated from the dam either by a movable partition or by tying in one end of the stall and allowed to nurse again only when the dam had been properly prepared, that is the hindquarters and udder thoroughly washed. This was repeated several times daily for a few days. After that the calf was fed only twice a day and then from a pail. If there was any evidence of scours all food was withheld for twelve hours and the calf was given a dose of aromatic oil, made up of mineral oil containing camphor and eucalyptus. This was followed by a diarrhea mixture containing camphor, kino and formalin. The latter was repeated as often as seemed advisable. Where indicated stimulants were given in a little boiled milk as an adjunct.

We still follow this method of treatment in our practice with the addition of course of biologics, but I am thoroughly convinced, after some twenty-five years' experience and after having had the privilege of consultation with some of the best veterinary practitioners in the country, where calf scours threatened to literally ruin some stockowners, that in order to insure success biologics must be supported by sanitation if this scourge is to be conquered. I am also equally as sure that unless the proper use of biologics is carried out most faithfully, the stockowner will be injured and the veterinarian and the treatment condemned.

To illustrate what I mean, I will cite a particular herd in one of the New England states. About eighteen months ago, I was called in consultation by the veterinarian in charge of this herd, consisting of seventy-two mature purebred females. There were seven living calves on the farm. The loss from white scours for over a year had averaged about ninety per cent, notwithstanding that many things had been tried. The experience of this veterinarian was very much like that of the one whose inquiry prompted this article. We instituted sanitary procedure at once and instructed the herdsman and nightman to notify the Doctor as soon as a cow showed any evidence of calving. Either the Doctor or the herdsman accordingly took care of the navel. Newborn calves received at once 30 c.c. of anti-calf-scour serum and 2 c.c. of bacterin. Every calf received either 3 or 4 c.c. of bacterin on the fourth or fifth day following the first dose. If a large calf 4 c.c. were given, if very small, 3 c.c., and a week later 6 c.c. were given. A dose of aromatic oil was also given after the calf was a few hours old. If at any time a calf showed drowsiness other treatment as outlined above was begun and another 20 c.c. of serum given at once. If there was any evidence of diarrhea a high enema of warm water to which had been added a little bicarbonate of soda was also given. We cautioned the herdsman that past experience had led us to believe that each calf would need to be watched and serum given from time to

time until a sufficient period had elapsed for the bacterin to help establish immunization, which would probably be about a month. We also cautioned that this regimen would need to be kept up for months until the infection on the place had been subdued by sanitation and lack of re-infection.

Accordingly this treatment was carried out with marked vigilance until forty-four calves had been born without a single loss. Then some one suggested trying to do without serum and bacterins with the result that the forty-fifth calf died. The method was then put in vogue again until the following summer, making a period of about a year. The infection on this farm now seems to have died down.

Infant Mortality in Swine—Cause and Prevention*

A. T. KINSLEY, Kansas City, Mo.

The Feeding of Orphan Pigs

THE TERM "orphan" as applied to the human family designates a child that is deprived by death of one or two parents. As used in the following discussion, although it may not be etymologically correct, the term "orphan" is applied to pigs that are deprived of their mother's milk. Pigs may therefore be orphaned first by the death of the sow, either at the time of parturition or subsequently before the pigs are weaned; second, by any condition that will cause a cessation of milk production. Pigs farrowed in excess of the number of teats possessed by the sow may also be designated orphans.

The successful feeding of orphan pigs is important because of the large number of them. Economically, it is worth while to attempt to raise not only pure-bred orphaned pigs, but also grades. It is advisable in the feeding of mammalian orphans to provide a food that approximates as closely as possible the composition of the mother's milk. The quantity and quality of sows' milk should, therefore, be the basis for the preparation of food for orphaned pigs. The approximate composition of sows' milk is fat 7%, albumin casein 6%, sugar 5.7% and ash 1%. The fat globule of sows' milk is about ¼ of the fat globule of cows' milk. The average sows' production is from 4 to 7 lbs. of milk daily. The average litter is 8 to 10 pigs. The quantity of mother's milk produced by an average sow that has an average litter is about ½ lb. per day for each pig.

Great care is required in feeding the orphans that are only one or two days old and especially if they were deprived of the colostral or first milk. If it is possible they should be permitted to suckle another sow at least once or twice. Such pigs should be provided with a modified milk. A modified milk that has been fairly successful in supplying the demands of orphan pigs from one to ten days of age, is prepared as follows: one pound of cows' milk, one pound of lime water, one-fourth pound of separator cream and one-eighth pound of sugar. If milk sugar is available and not too expensive, it will be more satisfactory than cane or beet sugar. The ingredients aforementioned should be mixed in clean sterile vessels and pigs from one to ten days of age should be given approximately one-half pound equally divided in 4 or 5 different feedings. The basic principle that pigs should not gain in weight until they are ten days of age should always be kept in mind when feeding orphans. After the pigs are ten days of age, the composition of the prepared milk can be gradually changed, reducing the lime water, cream and sugar, and by the time the

* Continued from March issue.

pigs are three weeks of age ordinary cows' milk can be used. It will be found that pigs two or three weeks of age will begin to consume grain. Readily digestible grain in limited form should be provided until the pigs become accustomed to coarser feeds.

Generally speaking, it is not necessary to provide a nurse bottle for orphan pigs. If prepared milk is placed in shallow vessels and the pig's nose firmly held in the milk in the vessel, it will soon begin to drink, of its own volition.

Great care must be exercised in maintaining all equipment used in the feeding of orphan pigs, clean and sanitary, as well as their surroundings. By following out the foregoing general directions, thousands of orphan pigs can be saved annually.

Proper housing safeguards little pigs

The extraordinary losses of suckling pigs during March and the first part of April, 1923, in the North Central states were proof of the necessity of proper protection of recently farrowed pigs. Swine were not provided by nature with a coat of hair or wool like other farm animals to protect them against weather conditions and particularly sudden changes. The thin coat of bristles is insufficient to protect swine and particularly little pigs against inclement and especially unseasonable weather, and it is not only humane but also economical to properly house these animals.

Successful hog production is primarily dependent upon safeguarding the little pig. Corn and other feed crops are most profitable to the producer when consumed by and marketed as live stock. Swine are the most economical means of the marketing of corn and other feed crops and therefore the saving of pigs is of prime importance to farmers, particularly in the Corn Belt.

Most farmers in the central states have enough pigs farrowed to consume all the corn they produce, but a relatively few of them save more than 50 per cent of the pig crop and it becomes necessary to sell corn as such or purchase stock hogs. The sale of corn is not as profitable as the feeding and sale of fattened meat producing animals and the purchase of stock hogs is more expensive than raising them and therefore it is most economical to produce and save sufficient pigs to market the corn.

The successful and therefore economical production of pigs is dependent upon providing proper surroundings and especially housing of the pigs at the time and for a few days after farrowing.

In the construction of hog houses, the following points should be given consideration: adaptability for the purpose desired, ease of cleaning and disinfection, and convenience. Permanent farrowing houses are not in favor with most breeders because of the impossibility of efficient cleaning and disinfection and the difficulty of rotation of lots. Straw sheds although cheaply constructed are to be condemned because they are insanitary. Temporary sheds and farrowing houses that can be easily moved from one place to another are preferable.

Under certain conditions permanent farrowing houses may be desired. Such houses may be constructed with lumber, stone, brick or hollow tile. It is generally conceded that concrete floors are desirable in permanent farrowing houses, providing that some surface covering is used that will overcome or diminish the dampness and cold characteristic of concrete in cold weather. Plank and cork brick have been successfullly used for this purpose by many breeders. In the mild climate of some of the southern states it is claimed that an ample covering of bedding overcomes the objectionable features of a concrete floor in the winter time.

A permanent farrowing house should be conveniently located in relation to food and water supply and care should be exercised that there will be good drainage. A single farrowing house is probably the most economical. The type of single farrowing house in most common use is the so-called "A" house which is so constructed that it can be readily moved by horse or motor power. Every farrowing house should be provided with a pig

rail about eight inches above the floor and about the same distance from the sides. The pig rail saves many pigs that would be crushed by careless mothers.

That the subject of ventilation has not been given proper consideration by the builders of hog houses is evident to those who have inspected their buildings in practically every section of the country. Proper ventilation is especially necessary in farrowing houses. Little pigs are delicate and are very subject to the action of drafts and the successful breeder has the farrowing house so constructed that the recently farrowed pigs will be kept dry and warm, away from drafts and amply provided with fresh air. This is especially a fact in the Corn Belt where the hog producer aims to have the sows farrow about the first of March, in order that the hogs may be finished in the fall.

In a well ventilated hog house, the walls and windows will remain practically dry even in cold weather. Various types of hog houses have their supporters. The style of hog houses that are to be used for farrowing purposes is immaterial, providing they are convenient and so constructed that the animals can be kept dry and supplied with an abundance of fresh air and light. The double hog house with a center hall is the most economically constructed per pen. These hog houses should have north and south exposure. However, this type of hog house is not as useful in the northern portion of the country because of the fact that the north pens are not of much value in the fall and winter. In the colder sections of the country, hog houses may be constructed in which the pens are on the south side only and with a hall extending along the north side of the pens. In other words, this house would be the same as the double hog house with the center hall, leaving off the north tier of pens.

Some prefer the individual hog house, particularly for farrowing. These are relatively economical and if properly constructed are easily and readily moved from one place to another and can be efficiently ventilated. In the construction of the double hog house or one-half of the double hog house for colder climates, it is advisable to make an offset in the roof, in order that windows may be placed in such a position that the pens will be amply lighted. This also provides a means for proper ventilation. A second row of windows should be provided in each side of the hog house, the bottom of the window being about three and one-half feet above the floor and hinged at the bottom so they can be lowered from the top. In the indidivual hog houses, hinged windows should be placed at the ends and a ventilator above. Exhaled air contains many impurities and other excretions contaminate the air with injurious gases. If exchange and renewal of air is not provided the animals become sluggish, and have less resistance to disease.

Improper ventilation is responsible for the loss of hundreds of pigs annually. Damp, musty pens with contaminated air, naturally diminish the pigs' resistance and they become subject to pneumonia, swine plague and other pulmonary disorders. Diminished resistance due to improper ventilation and lighting renders pigs more subject to necrobacillary infections.

Unless the quarters are dry and properly lighted, the various parasites of the intestines and lungs develop in the litter in the pens and readily contaminate the pigs and this is a source of the primary infestation with parasites which frequently depletes the pigs so that they are easy victims for a variety of diseases. Proper ventilation maintains the resistance of the pig so that it is not as subject to hog cholera as it would be if it were not provided with an abundance of fresh air.

With the proper means of housing and especially if hog houses are properly ventilated, the production of pigs can be easily increased and will thus insure an increased income to the hog industry.

Sterility and Its Control Among Dairy Animals*

J. W. BROWN, Ft. Scott, Kansas

Acquired Sterility

6. *Infections and Their Control*: In dealing with acquired sterility, this is the most outstanding condition that the writer has had to contend with. As a rule the dairyman does not seek help or does not realize the importance of sterility in his herd until it appears in the form of a contagion.

The first division the writer wishes to make under infections is early infections transmitted from the mother to her offspring, such as tuberculosis in badly infected herds, especially where it exists in the pulmonary and udder form. It is in those herds where young animals are allowed to remain with the mother the first few days where one encounters early infection with the pulmonary type of tuberculosis, it being transmitted to the calf due to the mother licking it or contaminating the surroundings such as in the maternity pens. Needless to mention that in cases of udder infection, the young on getting the milk will, of course, become infected.

One is again confronted with infection of the offspring from the mother in those cases where the mother carries the contagion of abortion, the infection being picked up in the vagina or through the lacteal fluid. In a number of instances, infectious dysentery or calf scour can be traced to this infection, leaving the calf weak and often stunted in development. I have noted a number of cases of ovary and fallopian tube infection that might be traced to the early infection of scour produced from the contagion of abortion. The same condition applies to tuberculosis infection transmitted to the young and localized in the reproductive organs, producing sterility in these animals when bred at maturity.

* Continued from March issue.

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Then in young animals or female animals there is the condition known as mixed infection. The history is usually of a dead fetus which died before delivery and was not delivered by the mother at the proper time. This may give rise to a condition of mixed infection, where there is a breaking down of the membranes and the soft parts of the fetus in the womb. The danger to the life of the mother is great, and in event of recovery, there is temporary sterility at least. Yet under this same condition where the os uteri happens not to dilate sufficiently and no infection gains entrance to the uterus, there is absorption of the membranes and the soft parts of the fetus, but the bones cannot be absorbed and remain in the uterus, producing sterility due to mechanical obstruction.

Next under infection as a cause of sterility is that of abortion. Abortion is an expulsion of the fetus from the womb before it has had sufficient strength and development to live outside of the womb. (Smith's "Physiology" and government report definition.) Under abortion one must consider both contagious and noncontagious. Yet it is almost impossible in many cases, without considerable effort and observation, to draw the line in a newly infected herd when it first crops out.

It has been proved by observations and practical experience that abortion due to infection depends largely upon the susceptibility of the animals and the virulence of the germ of infection. The writer has noted herds where the infection was known to exist and after a period of as long as two years it seemed the disease producing power of the germ was checked. Yet in the following year it reappeared and produced results showing that it was as potent as on its first ap-

pearance. This break in the virulence has caused some investigators of this disease to believe that a herd where contagious abortion existed would become immune within a period of three years. This the writer believes may be a plausible theory to work on, but it is impractical knowledge to give to the dairyman now as all herds must continually bring on new young animals to keep them up, and as the germ passes through these young animals, if some corrective measures such as feeding, selection and vaccines are not practiced, the germ will increase its virulence. On the other hand, if these new animals are not added to the herd but the same immune animals are kept, their usefulness will in years diminish and cease altogether due to their age, and no gain has been made by checking the sterility.

Poor conditions, weakness and poor blood due to some diseased condition such as internal parasites, kidney trouble, kicks, slips, etc., are often causes of a predisposition to non-contagious abortion. In instances where the feed is poor in mineral elements such as calcium phosphates, iron and vitamins, with the female carrying a calf and the animal being a large milk producer, there is a tendency for a change in the tone of the body which subjects animals to non-infectious abortion, which malady may bear a similarity to contagious abortion. In many cases of under nourishment through lack of minerals in the feed in herds of large milk producers, there is death of the young fetus in the womb, and the body of the mother in this weakened condition picks up streptococcic or mixed infection, producing a condition quite similar to contagious abortion where the bacillus of Bang exists.

In practically all diseases where there is excessive fever, abortion is brought about, and especially in those diseases where the lungs are involved, not allowing proper aeration of the blood that is being carried to the developing fetus.

Again under infection in herds, leading to sterility, we must not fail to consider ergot poisoning, although it is not a direct infection. Whole herds have been affected in this manner, losing their calves due to being fed foods containing the poison, and those not aborting were so weakened that the reproductive organs became susceptible to streptococcic mixed infection and catarrhal infection of the vagina.

In the faulty construction of dairy barns, where there is too great a slope of the floors, a condition results that weakens the reproductive organs and subjects animals to existing infections that are always present in dairy surroundings. Where there is too great a sloping of the floors, when the animals lie down, too great a strain is placed on the uterine ligaments, leading to abortion and infection, all of which tend to early sterility if not corrected. Again under faulty construction of floors, making them slippery and where concrete floors are made use of with insufficient bedding, rheumatism may affect the animals, resulting in infection and early sterility.

Contagious Abortion: This is an infectious disease which affects cattle and other animals, but here the discussion will be only with reference to dairy cattle. The causative factor in this great economic disease is still somewhat in dispute, but the bacillus of Bang is one germ always present. The disease is characterized by an inflammatory condition of the reproductive organs of the female and results in the expulsion of the immature fetus from the third to the seventh month, and it plays an active part in the cause of sterility in the dairy female. As to the male, it is known to affect the testicles and cause sterility in them, but usually it does not cause any physical change in these animals. They just serve as carriers of the germ to healthy females through the act of copulation.

The bacillus of Bang is the organism known to be one of the causative factors in abortion, but the writer's experience has been that there are a number of associated factors that have equally as great a bearing on abortion as this bacillus, es-

pecially when they are coupled together; namely, feeding, group feeding, feeding food weak in vitamins and minerals, poor sanitation, poor hygiene, poor selection of breeding animals.

Many writers claim that the infection of contagious abortion is transmitted through the digestive tract and that calves are infected while suckling infected mothers. As to the digestive tract infection, the writer has noted cases where this in all probability might have been the method of transmission, but as to the calf harboring the infection from calfhood to maturity, I have not found this to be the case to the extent that the calf is a spreader of the disease to other mature animals. These cases almost always show up with diarrhea, scour and dysentery, and those that do not succumb to these maladies become weak and stunted, and the abortion and sterility can usually be traced to the weakened reproductive organs brought about by the ravages of infection in early life.

As to feeding, it is a fact proved by the writer that this manner of contact brings the spread of the infection, which is magnified when group feeding is practiced. The greatest source of the spread of the infection of contagious abortion as noted by the writer is by contact, the discharges of the diseased animal soiling the external genitals, tail and hind quarters, whereupon susceptible animals by coming in contact through riding, licking or feeding together get the infection on their vulva, and it soon finds its way into the genital tract producing direct infection, followed by symptoms of abortion in the animals if they have not produced a resistance to it through proper feeding, physical development and selection.

Another common mode of infection, though disputed by some writers, is through the bull or male animal, he having gotten the infection while serving an infected cow and the disinfection of his sheath after each service is neglected. He harbors this infection on his external genitalia and through the act of copulation transmits it directly to the uterus of the susceptible female.

Dairy cows and heifers of all ages are susceptible to the infection of contagious abortion, but virgin heifers and animals with weakened reproductive organs brought about through improper treatment in diseases such as retained placenta, lung diseases, and through poor feeding and poor sanitation, are more susceptible and more readily succumb to the infection.

The offspring of infected cows, according to my observation, have no immunity to the infection and in the majority of instances show a weakness to the infection due to the inherited weakened generative organs. Each dairy breed under as similar conditions as possible, has about the same degree of natural resistance to contagious abortion, and that is small. There have been instances in herds where some animals have aborted a time or two and later carried their fetuses to full time, but such animals invariably have retained placentae and are a great source of spreading the infection to other susceptible animals. They invariably have a discharge, which clears up only by scientific treatment with the use of antiseptics, massage and corrective feeding with reference to vitamins and minerals. These cases have been misleading to some and have caused the theory to be advanced that an immunity exists, but if the condition is observed in a herd over a period of years, it will prove to be only a weakening of the virulence of the causative organism. When new blood is introduced into the herd and the germ passes through these animals, the disease resumes its virulence, and the old spreader, if she has not become permanently sterile, will begin to abort again.

The last topic under infection leading to sterility is that of catarrh and vaginitis. Vaginitis is an infection noted among dairy herds and has a peculiarity in that it seems to appear at one time more than at another. I mean by this that it will disappear from a herd, only to reappear

later. It is noted mostly in herds treated for contagious abortion but has been observed in herds where infectious abortion did not appear to exist. This condition does not have the economic importance equal to that of contagious abortion and responds readily to treatment with mixed infection vaccines and sanitation. In animals where this infection follows abortion, many cases of hard breeders and permanent sterility are experienced.

As to catarrh of the vagina, it usually follows infectious vaginitis or long standing cases of contagious abortion, coupled with the use of too strong antiseptic solutions in douching. The condition is hard to treat so as to leave the animal in a physical condition to easily conceive. Most animals so affected become hard breeders and later end up permanently sterile.

7. *Paralysis, Extrauterine Pregnancy and Retained Corpus Luteum*: Paralysis of dairy animals caused by poor feeding, difficult delivery of a large fetus, too much inbreeding and injuries bringing about physical weakness, cause a weakening of the reproductive organs and a physical condition that prevents the successful performance of the act of copulation, all of which results in sterility.

Extrauterine pregnancy is a rare condition in dairy animals, but when experienced usually leaves the subject sterile if the animal does not succumb to the operation performed in handling such cases. This condition may exist where the fetus develops in the fallopian tubes, ovaries or in the abdominal cavity, in all of which cases the animal becomes sterile with the exception of abdominal pregnancy, where a successful operation is performed, making it possible for the animal to conceive again, but the writer has never observed this condition. In cases where only one ovary or fallopian tube is involved, the condition can be successfully removed, and the animal may conceive again from the other ovary.

In retained corpus luteum following parturition, we are confronted with a sterility that often proves vexing in that the animals come in heat sometimes regularly, then again irregularly, but fail to conceive. This form of sterility may be relieved by the removal of the corpus luteum. The performance of this operation often proves difficult as the yellow body may be very hard to press out; at other times it is easily accomplished. Associated with this condition are cystic ovaries. These mostly cause temporary sterility, because the rupture of them usually brings about conception, but at times it is found impossible to wholly rupture them. All such animals become permanently sterile. Again the injury suffered by the ovary in this condition may subject it to infections that produce sterility.

Summary

Sterility of dairy animals is one of the greatest sources of trouble to the dairy industry. The writer believes it can be controlled by proper feeding of animals from birth to maturity, selection of good, physically developed animals, practice of hygiene on male and female and on all pregnant animals.

Under feeding, where cases are encountered leading to sterility, the proper step to take is to add to the rations vitamins and minerals such as cod-liver oil, yeast, lime, bone meal and alfalfa. As to physical fitness of breeding animals, one should note the strong points of the female and see that they blend with the strong points of the male, always keeping in mind fully developed reproductive organs. Breeding should be along the line of producing a gain in stamina and reducing physical weakness in the herd. These factors together with hygiene, care of the male and female reproductive organs, use of mixed infection vaccine to stimulate resistance, and cleanliness of quarters with faultless construction as to light, ventilation and comfort, will be found to go far toward removing the greatest pillars of sterility.

Some Insects and their Relation to Man*

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From the beginning of history to the present time man has been a prey to insects and consequently a sufferer from diseases which they are capable of transmitting. It is impossible to estimate the effect which this insect activity has had upon the human race.

If one were asked to name the safety device which has come into common use during the last half century which has saved the greatest number of lives and prevented the greatest amount of illness which could not otherwise have been prevented, one would be quite safe in designating the ordinary fly and insect screening. It is quite probable that most of us do not realize many of the advances we have made in controlling the spread of insects because we are very prone to accept new comforts and forget former hardships as well as the lessons connected with them. We do not commonly think of the important part which insects have played in history, how they have overthrown dynasties and even wiped out whole countries or civilizations or reduced them from a position of commanding superiority to one of helpless subordination. They have defeated victorious armies on the way to conquer the world and at times have allied themselves with the defeated who were thus able to turn inglorious defeat into substantial victory. It is only in the last forty years that we have begun to comprehend and thereby raise ourselves to a plane superior to our insect and other untoward surroundings, and the fly-screens, the insecticides, the disinfectants and the appurtenances thereto are the symbols of our long deferred superiority and victory.

Five hundred years before Christ, or about the time of Pericles, Greece was the center of power and of culture and intelligence. It was only a few years later that the anopheles mosquitoes of the country became in some manner infected with malaria, called by Hippocrates "the burning disease," and the country began immediately to decline and never again was a predominant factor in the history of the world. The disease became general and was sufficient to produce a physical and mental deterioration in one of the strongest and most virile nations the world has produced. Today malaria is one of the great problems in Greece and when this condition is overcome there should be an improvement in their mental and physical condition though some time and doubtless some new blood will be required to overcome the results of two thousand years of malarialization.

Mesopotamia up to 500 B. C., had a relatively high degree of civilization but became weakened by the constant fight against malaria so as to become what might be termed a "low vitality" nation. It thus became invaded and captured by enemies from the higher lands who in turn suffered the same fate.

Egypt also a "low vitality" nation had developed a high type of civilization and culture but fell a prey to malaria, typhus bubonic plague and other insect transmitted diseases. Following this decadence, it endured a regular succession of conquerors, each in his turn succumbing to the same insect borne diseases which had overcome his predecessor.

As with the preceding countries, Mace-

*Delivered before the Insecticide and Disinfectant Manufacturers Assn., Hotel Astor, New York City, Dec. 15, 1925.

donia had built up a civilization of its own but fell in the same manner and at the present time is still in the grip of this curse of anopheles mosquitoes which make civilized life and proper mental and physical development impossible. During the War, there were about 750,000 allied soldiers in Macedonia and of this number about one half were infected with malaria and any army with one-half its number on sick report has neither time nor ability to accomplish much else. It might also be said that any country so infected is hardly worth fighting over.

During the last few years we have begun to explore the numerous and extensive ruins which are the only remains of former civilizations once existing in the southern part of Mexico, Central American and Peru The Mayans inhabited the country in and about Yucatan and at one time their main city Chichen Itza, was the largest city in this hemisphere. Malaria and yellow fever appeared and this strong country began to degenerate until it was no difficult matter for the Guatemalans to come down from the higher lands about one hundred miles away and capture the country. The Mayans left behind them traces of a civilization which showed advanced knowledge of astronomy, chronology, mathematics and architecture but unfortunately for them they never learned that the stegomyia mosquito is responsible for the transmission of yellow fever and the anopheles for malaria.

Following the decadence of Greece, Rome made itself the world power but along with other factors the insects soon made themselves manifest. The anopheles mosquitoes throughout Italy became infected with malaria possibly through travelers from Greece who had been infected there and carried the organisms in their blood. The disease soon became epidemic in the low lands and especially in the region in and around Rome. The traders and crusaders all carried their full quota of insects and so in addition to malaria they had frequent epidemics of bubonic plague, typhus and relapsing fever with an assortment of contact and fly borne diseases and Rome was on the downward path. But as frequently happens the insects became not only their enemy but their ally as well. In 936 A. D., the Emperor Otto attacked Rome and while his initial military operations were successful yet his army soon became infected with a severe insect borne epidemic which destroyed his military preponderance. Henry IV of Germany captured Rome in 1081 and the insects then proceeded to put his army out of business. In 1137 A. D., Lothar invaded Italy but in a short time the malaria was too much for him and his army. In 1167 A. D., Frederick Barbarossa captured Rome after a decisive victory but his army became infected with both malaria and bubonic plague, caused by mosquitoes and fleas respectively. The Romans rallied and destroyed the sick and what was left of the well, and Frederick was fortunate in escaping with his life.

The armies of the crusaders probably fared worst of all from the insect borne epidemics, particularly in the first, the third and the seventh or last. It was not, however, the loss of life among the members of the crusades which was so important but the fact that as they traveled along the way and returned to their homes, those who did return, they distributed the infected insects they carried with them or, infected insects already there with the diseases they carried and as a result these epidemics became general through what was then the civilized world.

During the Thirty Years War as well as many others there was a far greater loss of life due to the transmission of disease through insects than that due to battle casualties.

In a similar manner to the countries already mentioned, may be explained the decadence of the civilizations once attained in Southern Arabia, Peru, Rhodesia, Ceylon, Java, Indo-China and India. In the Bible we find records of plagues, we find the same in Egyptian hieroglyphics, in the Assyrian and Phoenician records and in fact all history is full of such occurrences. The course of the world has been changed and altered, and changed again beyond our

power to estimate by these vast plagues of disease and often a humble and despised insect has been the cause of the trouble.

It is not many years since the interior of Africa was an unknown wilderness. Within this country was an area in which the dreaded African sleeping sickness was present. The natives did not travel far from home. The Tsetse fly which transmits the disease did not move far from its habitat along the water's edge and only the wild animals which harbor the parasite moved to any extent. But along came civilization and trade channels were opened up and the natives began to move around with caravans, and the wild animals were disturbed and compelled to seek new ranges, and at the present time the infection has spread over at least one-fourth of the continent and thousands of miles have become depopulated. The percentage of fatal cases in this disease is very high if untreated or not treated early. At the present time it is dangerous to pass through the highly infected regions and a sufficiently prolonged residence generally results in infection. It is not possible to kill all of the Tsetse flies nor to destroy all of the wild and domestic animals which harbor the parasite. It is quite probable that the disease has been in the United States during the olden slave days but there was no Tsetse fly to transmit it to animals which serve to keep it going and serve to infect other flies, which in turn infect human beings. It is to be hoped that this fly will never gain access to this continent.

I have read with great interest DeFoe's account of the great plague in London. I do not believe it is possible for us to conceive of the horrors these people underwent and therefore we are perhaps not properly appreciative of the blessings which have come to us as a result of the advances which have been made in the field of preventive medicine and sanitation. In my estimation this is the outstanding achievement of the century beside which other developments are not to be compared. These facts and procedures have not evolved themselves but are the results of the co-operation of bacteriologists, zoologists, hygienist, physicians, chemists, manufacturing chemists and others. Here in the United States and in certain parts of Europe, the principles of preventive medicine have become so well established that the measures to be employed are generally known and have become incorporated into the municipal and other laws. The procedures which we consider as obvious and a matter of course are entirely unknown over a considerable portion of the earth. There are languages and dialects which have in them no words corresponding to disinfectant, insecticide, antiseptic, etc.

It was a difficult matter to establish the proper sanitary measures in Cuba, Panama and the Philippines and secure their general observance. It has been a matter of years to train these peoples and even now they are prone to relax their care and ignore the fundamental rules which are instituted for their own good. It, therefore, requires constant watching and pressure upon our part to maintain hygienic conditions and prevent, so far as it is possible, the needless presence of easily preventable diseases.

Some years ago a small epidemic of cholera started in one of the Philippine villages. Word was sent out to establish a quarantine. When the health officers arrived the local health officer was requested to detail the measures which had been taken. He said he had established a quarantine and took them down to the bank of the river where he proudly showed them an American flag floating from a newly erected flagpole, which was his idea of a quarantine. He failed to grasp the idea of what was being attempted and that is the point of this tale.

The proof of the intelligence of a race is their ability to raise themselves above and protect themselves from adverse environment. The Nordics have shown themselves able to do this and were the first to gain a substantial victory in the continual fight against insects and this is, I believe, one of the important manifestations of their superiority. The average expectancy of male life in the United States is about 50.6 years

and in Sweden is about 50.9 years. In India it is about 23 years and it would be less if the population were greater or the birth rate were higher. The combination of insects, ignorance and insanitation is the explanation. As an indication of what can be accomplished, the African Gold Coast annual death rate from 1881 to 1897 was 75.8 per thousand. In 1911 it had been reduced to 13.9 per thousand and the reduction was practically all in insect borne diseases.

It would be interesting if some students of history were to cite us to any instances of where the inhabitants of the tropics or lowlands had defeated those from the highlands or colder climates on anything like equal terms. Such instances would certainly be in the minority. We ordinarily think of mountaineers as hardy and vigorous people and the residents of the tropics as lacking in strength and stamina. Unquestionably there is a climatological reason for some degree of difference but there is another and possibly more important element. The resident of the tropics who does not protect himself, is engaged in a constant conflict against insects and the parasites which they transmit and as a consequence his vitality becomes lowered or he becomes the victim of disease. Men can not continue for generation after generation upon a low plane of vitality without degeneration and decadence, physically, socially, mentally and morally. It has, however, been shown that under proper precautions, inhabitants of temperate regions may emigrate to the tropics and live there without manifest injury. This requires the avoidance of mosquitoes and other insects, the constant use of boiled water and many other precautions which at times are somewhat irksome. Those who comprehend their importance are less likely to ignore them.

Some of us may remember the days when yellow fever was the curse of the tropical and semi-tropical western hemisphere. Some of us may remember or have heard of the consternation which was caused at the times when it gained a foothold in the United States. When we entered into war with Spain and invaded Cuba this was the greatest obstacle with which we had to contend. The Medical Department realized that the first step in the control of the disease was to learn the method of transmission and accordingly work was begun under the direction of Drs. Reed, Carroll, Lazear and Agramonte. In order to test all the various theories of transmission, volunteers were called for from the soldiers and officers of the Medical Department who were not immune to the disease. Attempts were then made to inoculate them with the disease by all of these various means and eventually it was found that the stegomyia mosquito, which had bitten a yellow fever patient during the first three days of the disease, was capable of transmitting it after a period of twelve days had elapsed. I think you will agree with me that a considerable degree of courage was required by these volunteers and those who lost their lives are entitled to all the honor which can come to any soldier who has fallen on the field of battle. As a result of this work we now know how to prevent the spread of yellow fever and as a consequence it has almost disappeared. It is the plan of the Rockefeller Foundation to destroy all foci of yellow fever and wipe it from the face of the earth and it seems very probable they will succeed in their endeavor. During the last few years Professor Noguchi of the Rockefeller Institute has been studying yellow fever and has in fact isolated the germ which causes it but he has had some difficulty in securing a sufficient number of infected cases to work with.

The diseases which are transmitted by mosquitoes are malaria, yellow fever, filariasis and dengue fever. Malaria and yellow fever require no further mention. In filarial infection the mother organism locates itself in the lymphatic structures and gives birth to small motile organisms which occupy the blood channels by night and by day retreat to the liver or spleen. There may be no manifestations or there may develop a condition known as elephantiasis which is manifested by extreme enlargement more particularly in the lower extremities and may totally incapacitate the

unfortunate victim. Dengue fever is also known as breakbone fever and is quite common in the Philippines and other portions of the tropics. It is not commonly fatal but is extremely painful and unpleasant to those who become infected.

The general rules to be followed with mosquitoes are as follows:

(a) Prevent so far as possible all mosquito propagation.
(b) Kill all mosquitoes possible of those which do breed.
(c) Keep habitations away from mosquitoes and mosquitoes away from habitations.
(d) Protect the sick from mosquitoes.
(e) Protect the well from mosquitoes.

It was the application of the above rules which made the building of the Panama Canal possible and life there as safe as in the temperate zones.

With us there is no question but that the common house fly is the most frequent transmitter of disease. There are also biting flies which are responsible for the spread of other diseases. Among the diseases which the domestic fly carries are typhoid fever, cholera, amebic dysentery, bacillary dysentery, gangosa and oriental sore or Bagdad boil. In the first four diseases the fly transmits the infection by carrying organisms from the discharges of the sick to the food of the well. These diseases may be transmitted by other means but the fly is a common method. These four diseases are all death producing and have been the cause of countless deaths. The latter two diseases are relatively unimportant and are only found in a few places in the tropics.

Obviously it is desirable to accomplish the same ends with flies as with mosquitoes though different methods are necessary. With the partial disappearance of the horse from crowded communities, the problem of the fly has become less difficult. Screens are of course a necessity to prevent their access to the sick and the well and to food supplies. All infected discharges from the sick should be sterilized before being disposed of. Fly swatters, fly paper, fly poison and traps all have their places.

It may be a matter of interest to know that there are relatively few flies in the Philippines and the reason is that a variety of ants of which there are countless numbers, prefer the fly larvae as food and in that manner are of great assistance to the sanitarians and the general health of the islands.

There are a number of cousins of the domestic fly which cause harm and the following diseases are transmitted by them: yaws or framboesia, filariasis, Tularemia or deerfly fever, cutaneous tropical myiasis and African sleeping sickness. Yaws is widespread throughout the tropics. It is manifested by sores over the body. It causes much invalidism but rarely ends in death. The type of filaria transmitted by the fly is very similar to that transmitted by the mosquito. Tularemia is a disease which is found in parts of Utah. It is accompanied with high fever and is carried by a horsefly. Certain biting flies deposit their eggs beneath the skin of man and when this happens the results may be exceedingly serious The African sleeping sickness has already been mentioned and is the most serious of this list. Obviously these diseases are difficult of control because the flies responsible are not domestic and it is impossible to entirely control their spread and propagation. One can not always stay behind screens, and headnets and gloves have their objections.

There are three kinds of fleas divided into those which live on the rat, those which live on the dog and those which live on man. They prefer their particular host but if compelled by hunger will go to another. Fleas transmit bubonic plague, and Leishmaniasis or dum-dum fever.

Bubonic plague might be described as a disease of rodents, more particularly the rat and squirrel which may be transmitted to man by means of the flea which serves as an intermediate host. It may be either an acute or a chronic disease in the rat, but when the latter dies, as it may with the acute type, the flea is compelled to seek another home. In the absence of rats it may

settle upon a man, which is unfortunate for the man. It is easily understandable why once this disease has started it is difficult to stop. A good description of an epidemic is to be found in 1 Samuel, 5th and 6th Chapters. The expiation required of the Philistines was that they return the Ark of the Covenant to the Israelites along with five golden emerods or images of the characteristic swellings of the disease and five golden mice (or rats) basis of the disease. It is interesting to know that the reference was called to the attention of Dr. Yersin at the time he was working out the cause and method of transmission of the plague. During the reign of Justinian it was responsible for as many as 10,000 deaths in one day in Constantinople and it was this disease which was responsible for the first attempt at a quarantine in Europe. It is continuously present in China and there is a constant focus of infection in Mesopotamia and the Himalayas. This is the disease which was known as the Black Death of the fourteenth century.

The dog, cat, ferret and weasel are the natural enemies of the rat and may be used in the campaign against him. All dumps should be eliminated, all drains should be screened, all food supplies should be protected and all places cleaned up which might harbor them. There are many poisons, suitable, among them barium carbonate is the least toxic to man. Fleas are killed by a heat of 114 F. In a closed container sprinkled napthalene will kill them in 24 hours. If dissolved in benzene and used as a spray it will kill them instantly. Sulphur and hydrocyanic acid gas are also efficacious. Fleas may wander back and forth to a certain extent from the dog to the rat and vice versa and here is a possible complication which must be considered. It is easy enough to deflea a dog but it may be equally easy for him to find others to take their places.

Leishmaniasis and dum-dum fever are confined to certain areas in the tropics and not of so much importance to us. It should be remembered that on more than one occasion, plague has obtained a foothold in the United States and was only overcome at the expense of considerable time and money and a few deaths.

Lice are prolific transmitters of disease. It is rather difficult for us to comprehend the attitude of mind of a few centuries ago which so calmly accepted these various pests as dispensations of Providence and unavoidable. The Buddhist religion which has millions of followers, teaches that no animal life should be destroyed. For this reason these people are always a potential menace to the remainder of the world from which it is difficult for us to thoroughly protect ourselves. The spectacle of a Buddhist priest engaged in picking "cooties" from his body and laying them gently upon a stone from which they migrate back again to his body has always to my mind given a perfect demonstration of the word "futility." The diseases more commonly transmitted by lice are: Typhus fever, trench fever, and a form of relapsing fever.

Typhus fever is common over the world but the last thirty years has seen little of it in the United States, though still present in Mexico. This is a very fatal disease and during the Middle Ages and earlier when the louse had a higher standing in polite society, was the cause of many epidemics and great loss of life. Indian relapsing fever and trench fever, which are not so important to us, are carried by this insect. For a discussion of the means employed to get rid of "cooties" the reader is referred to any member of the A. E. F., who will doubtless do justice to the subject.

The tick is not a very common insect in settled parts of the United States but nevertheless it is at times exceedingly pernicious. Rocky Mountain spotted fever is prevalent in certain parts of Wyoming and Idaho and in the former state is accompanied by a mortality of from 75 to 90 per cent. In Idaho it is not nearly so fatal. The tick transmits this disease from squirrels and rats to man. The East and West African and the Persian types of relapsing fever are also transmitted by a tick. In the latter case these insects hide in the crevices and cracks of the house and at night come out and feed

upon the sleeping persons and thus infect them.

The bedbug is responsible for the transmission of the European type of relapsing fever which is found especially in Russia. This universal nuisance is of course handled by standard means with which perhaps some of you are familiar. However, the traveler in infected districts may find it difficult to avoid an infection. Fortunately with the discovery of salvarsan, we have a specific for this disease. This same remedy may be used with equally good results in yaws, gangosa and other forms of relapsing fever.

There are other diseases for which insects are responsible but those detailed are the more important ones.

There is a final thought which I wish to present to you. I can not help but believe there is a certain beneficial effect which results to the human race from the possibilities of epidemics, plague and transmissible diseases. When any collection of people or any country so far degenerates as to lose all desire for cleanliness and hygiene and proper living and subsist in dirt and filth, it is only a question of time until an epidemic comes along and kills them off. In the meanwhile their resistance and bodily vitality has been reduced to the extent that with the increased amount of preventable disease there is a high death rate among adults, a higher death rate among infants, a lower birth rate and they go backward. Unfortunately it happens with the workings of nature's laws that the innocent must suffer with the guilty. I am of the opinion that even without any disease at the beginning, it would only be a question of time until a multitude of persons living under such conditions developed their own diseases.

EXTRA FEED TO EWES BRINGS MORE LAMBS

The effects of "flushing" ewes (meaning extra feed at breeding time) upon lamb yields have been studied for several years by sheep specialists of the United States Department of Agriculture. The method, which is of English origin, appears to have a wide practical significance, since experiments conducted thus far by the department have resulted in much larger lamb yields.

A report of the department's Bureau of Animal Industry for the last fiscal year contains the results of flushing in two experimental flocks, one at the Government farm near Beltsville, Md., and the other at Middlebury, Vt. The year's results at the former farm showed an increase of 23 more lambs per 100 ewes as the result of the practice, while at the Middlebury farm the increase was 17 per cent. The percentages represent the increase above the normal lamb crop from similar ewes which did not receive the extra feed at breeding time. The results agree substantially with those obtained in former experiments.

(International Newsreel)

Dr. Moxley of Los Angeles, Cal., with five-legged dog. Except for the extra leg, which is at the left shoulder, the dog is normal in other respects.

CASE REPORTS

REMOVAL OF FILARIA FROM EYE OF HORSE

On December 4th a bay gelding, aged about twelve years, was brought to me for treatment for opacity of the cornea of the left eye. On examining the eye and while looking for the cause of the opacity, I saw a white, thread-like worm moving in the aqueous humor of the anterior chamber. I wanted to perform the operation for removal of the parasite, but as I was very busy with other cases, it took about two and a half hours to take this case in hand, and when the animal was down, the parasite hid itself behind the iris. I waited for about an hour or so, but it did not come out. I then released the animal with instructions to the sowar to bring the horse again the next morning when the parasite might be seen.

The animal was brought early in the morning. After casting the patient, a ten per cent solution of cocain hydrochlorid and an eye speculum were applied to the eye. A black cloth with a hole in it was put over the eye. The horse's head was raised a little. As there were no such fine cataract knives as Beer's or Graefe's at hand, I took a half curved suture needle and waited for the parasite to come in a suitable place. When it came toward the point of the needle, which I kept at the upper outer canthus, with a firm, strong thrust, I made a big enough incision at the upper outer canthus where the cornea and sclerotica meet. The needle was kept in to hold the aperture open. More than half of the parasite came out with the flow of the aqueous humor in such a manner as if the worm was very anxious to quit the place. The needle was soon taken out drawing the parasite with it. The white worm was readily visible on the black cloth and was placed in spirits of ether in a small bottle, which is now in the hospital.

The eye was washed with lukewarm boric lotion (25 grains to an ounce). The eye has refilled with the aqueous humor and the animal is all right. The advantage I find in a half curved needle over an eye lancet is that there is very little chance of puncturing the iris.

R. C. Misra

Rewa, India

VALUE OF A LAXATIVE IN MINERAL FEEDS

Considerable has been published with regard to the value of calcium, phosphorus and iodin salts in a mineral feed. Practically all experiment stations are agreed that they are an essential supplement to the organic ration of concentrates and roughages. Also in the work of Bohstedt, Bethke and Edgington of Ohio, considerable increased gain in feeding growing shoats was attributed to the addition of sulphur and iron.

The writer for the past three years has had charge of the experimenting with the formulas of a commercial mineral company and has found that the addition of a laxative in addition to the above mineral salts has in very many instances given gratifying results. The addition of one-fourth ounce of Glauber's salt daily to show cattle that are "going stale" increases the appetite and feed consumption.

Hogs at numerous times throughout the year are troubled with constipation. In late summer when grass begins to dry up and the weather is hot, farm animals do not take much exercise and at that time most feeders are usually short of grain and compel growing shoats and brood sows to get considerable of their feed from pastures. This in my mind is the forerunner of considerable of the swine plague which is very prevalent in the early fall when hogs are turned into corn fields.

In the winter most farms are not equipped with warm drinking water and farm animals do not drink nearly as much as they should to properly flush the system. Glauber's salt

creates a thirst which in many instances doubles the amount of water consumption and results in a greatly increased daily gain.

M. E. Scandrett, D. S. C. Agri. Chem.
Greenwood, Ind.

GASTRO-ENTERITIS IN THE HORSE

On April 16, 1925, at 8:30 a. m., I received two telephone calls, one right after the other, both being in regard to sick horses. Call No. 1 concerned the case I am about to describe, in which the owner reported that the horse was just off feed, not bad. On the other call, case No. 2, the owner claimed his horse was very sick and for me to come at once. I informed him I had another sick horse to attend to first and if he could wait for an hour or two I would be there. I told him he could give some ginger tea and put a blanket on the horse as he said the animal was covered with sweat. The owner decided to wait for me, so I started out to see case No. 1, about three miles away.

When I arrived at the barn, I found a six-year-old mare, weighing 1400 pounds, that had been used for a few days before in putting in the spring crop and had been fed quite heavily on oats, six quarts three times daily, and alfalfa hay, salt being given with the oats mornings. The horses in this barn were watered after feeding in the morning, a light drink being given at noon and evening when brought in warm, then fed hay, with water in full amount after dinner and supper, then given their oats. The owner reported that the mare appeared all right the previous evening, ate, drank, etc.

The patient stood in a single stall, her morning feed of hay and oats still in the manger untouched. She had an anxious expression, breathing a little fast but from the chest and not abdominal. She was covered with dry sweat as were the rest of the horses in the barn, supposedly from the previous day's work. Her eyes were dilated, mucous membranes congested, pulse full and bounding. Examination of the respiratory organs revealed nothing abnormal. Peristaltic action of the bowels was almost absent, especially on the right side. The animal appeared gaunt and rather dopy. She rested on one hind leg and then on the other. I listened for gas from the stomach but could hear none. Temperature 104° F. The owner claimed positively that the mare was in perfect health until that morning and then did not show any pain but simply would not eat. I was puzzled but made up my mind the trouble was in the stomach or intestines some place, and serious, too.

I advised that the mare be moved to a box stall, and she walked rather feebly. I might say here that the patient did not seem to have had any bowel movement during the night. Just as she entered the box stall, she passed urine, the color of which was normal. She was offered a pail of water and drank about half of it, after which she showed abdominal pain, lay down and tried to roll, then got up. The owner asked what was wrong, and I said I guessed it meant a dead horse, gastro-enteritis I believed. He was almost shocked and couldn't believe it, saying the mare hadn't been sick long and had not shown much pain, which seemed funny to him. I gave a quart of mineral oil with some anti-ferment in it. I prepared to answer the other call. When I had my grip packed and was about to leave, the mare's bowels moved, or one might say she was scouring, as the fecal matter contained a lot of undigested oats.

The mineral oil was given to prevent absorption of the abdominal contents, and the anti-ferment to check fermentation. The scouring movement of the bowels confirmed my diagnosis to my notion as it was the fermentation that made them move.

I visited horse No. 2 that the owner supposed was dying, and on arrival found the animal was better, had urinated and had a good peristaltic action. I gave a physic and worm medicine, examined the patient's teeth and informed the owner they needed fixing, which I did a few days later.

On returning to case No. 1, I found the mare's bowels had moved several times, enough to make one believe the animal could not have anything more in her. She looked very gaunt and was in considerable pain, but the peristaltic action was still absent, except on the right side, where was detected just that tumbling sound of the large intestines.

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A rectal examination revealed nothing unusual, the rear bowels being apparently empty. This was about 11 a. m. The owner, his wife, the hired man and family were all present, as this was a valuable mare, $250 having been refused for her a short time before.

The patient's pulse seemed to be getting weaker and the temperature was subnormal. I informed the owner that the mare was in danger and insisted on calling another veterinarian in consultation, to which he consented. This being the spring of the year, which is a busy time for veterinarians in this section of the country, with bad roads, we tried to get several different ones but without success. Some couldn't come at all and some not until night, so we decided to go ahead and treat the mare the best we knew how.

On returning to the barn I found the mare apparently in great pain. She would lie down, roll, get up, scour and turn up her upper lip, a gastric symptom. I gave carbon disulphid for bots, also sulphate of iron, tartar emetic and nux and gentian in capsule for worms, the nux to stimulate peristaltic action. I went home for dinner and returned at 2 p. m. My belief now was that if the trouble was not from over-feeding or from moldy hay, internal parasites, very likely bots, were the cause and had probably eaten through the lining of the stomach, but how could that be when the animal was in such good condition only a short time before?

The mare's condition at 2 p. m. seemed to be about the same, although the pain was not so great, and the peristaltic action seemed to have improved, the scouring apparently having stopped. This I attributed to the action of the anti-ferment and to the nux, stimulating the action of the bowels. Some claim when the bowels start to die through loss of nerve and blood supply, the scouring will of necessity stop and the peristaltic action picks up for a short time. I gave another dose of nux in capsule and decided to leave the patient alone until evening. I went home for supper and other business, returning at 8:30 p. m.

The owner was all done with his chores and a few of the neighbors had gathered around, all sympathizing with him and his mare, also making different suggestions. The mare had been in terrible pain during my absence, had rolled, gotten on her back in the corner of the box stall and kicked out the window. They rolled her over and she got to her feet. She was offered her oats, which she nibbled at, but she was not herself. Her temperature had gone way below normal. She was bloated, cold sweat covered her body, and she trembled when on her feet. The pulse was very weak with peristaltic action almost entirely absent. I came to the conclusion I could do no harm with whatever treatment I used, and if the patient's bowels lay still death was coming closer and closer every minute. So I started to give arecalin in half-grain doses every half hour for a few doses. This seemed to brighten the mare up and did not give her much more pain as I had expected, although it produced the arecalin salivation reaction. However, she became fuller all the time and belched gas from the mouth.

About 10 p. m., the pain seemed to be all gone, pulse imperceptible. She just stood on her feet looking from side to side. We put a blanket on her and the owner suggested walking her up and down the barn drive or in other words to try a little Christian Science treatment. But as time went on impending death became noticeable. Every one, even the owner, gave up hope and said, "Well, I guess Nellie, you will be no more tomorrow."

The mare's abdomen was almost tense with gas, the pulse could not be noticed, breathing fast. She dipped her nose in the water trough but could not swallow. She walked very stiffly, her joints cracking when she was moved. Finally I decided the best place for her was in the box stall and instructed all to keep at a distance from her as she was apt to fall over at any time, even backwards. This was at 11:30 p. m. The box stall was closed and we all departed for our roosting places with the problem solved, having decided we were going to have an autopsy in the morning and figuring on how we were going to get the mare out of the box stall.

The next morning I arrived at the farm at 9:30. The grave was half dug, and the owner had the box stall door open with the team and chain ready to hitch, which I did, and in a few minutes we had the body out of the barn and on the edge of the grave, which was about 100 feet from the barn. The team was returned, the owner got a butcher knife and ax and some warm water to which some creolin was added and the post mortem examination was tackled.

The lungs and diaphragm were first examined and appeared normal. The stomach was almost empty of ingesta but contained all kinds of bots, which had eaten all the lining of this organ and almost through in places. It seemed to be thicker than normal, especially at its outlet, which was almost closed. The small intestines were empty. The large colon and cecum contained quite a lot of material, which seemed poorly digested and very sour. I was surprised to find so much in these organs after all the scouring that had taken place. The rest of the tract was empty, and very little fluid was found. The bowels were dark colored and badly decomposed. The bladder was empty. My conclusion was gastro-enteritis from bots.

Was my diagnosis correct? How was my treatment? Where was it wrong and where could it be improved? Were the bots the true cause? How was it that carbon disulphid did not do the work it should? Some claim that bots do no harm, but I believe they do. How was it that this mare's condition had appeared so good if the bots bothered her? From the thickness of the stomach, etc., it could be seen that they were at work for a time. Some claim that it is after the horse dies and after he gets sick that the bots, in fact all internal parasites, attack the stomach and intestines. They claim that while the organs are full of food these parasites even aid digestion, that is, if they are not present in too large numbers. I do not agree with that.

I have had poor results with carbon disulphid in removing bots. I find grass is the best and again believe that in late spring or early summer the bots leave the horse.

T. J. C.

LYMPHOID GRANULOMA

In the February issue of Veterinary Medicine, I noticed a case encountered in practice by Dr. R. C. Calkins of Fairbury, Ill. I have had two such cases in practice in the last year.

No. 1. March 3, 1925, dapple gray mare, eight years old, with hard swelling of the throat about the size of a man's fist. It was at first thought to be a deep abscess, and the growth was incised, discharging a thin serous exudate. Three weeks later the swelling was as large as a gallon pail. The swelling had started between the forelimbs. On June 26th the mare died of strangulation, the swelling extending from the throat to between the forelimbs.

No. 2. September 1925, black work mare, nine years old, noticed with a like swelling. She was destroyed on January 10th. The edema was the same as in No. 1. Both cases had discharges from the nostrils, temperature normal to one degree above, a very persistent cough, mucous membranes normal.

The usual treatment was given including bacterins, but without avail. These cases were diagnosed by two different laboratories as lymphoid granuloma, which is not of a malignant character. Postmortem examination showed nothing abnormal, except enlargement of lymph glands, which were very dark in color, and the edema contained a serous exudate.

J. S. Gwaltney

Saunemin, Ill.

The achievements of surgery are wonderful. The successful removal of the pituitary gland from dogs and the transplantation of male sex glands have been accomplished experimentally.

A diet containing either hemoglobin, adrenalin or histamine has proved effective in the treatment of experimental animals affected with rickets.

It has been demonstrated that dried brewer's yeast contains some essential fac-

tor other than vitamin B and this product may be found of value as a supplemental food in certain diets.

PYOMETRA, (CHRONIC ENDOMETRITIS)

Pyometra in cows, an accumulation of pus in smaller or larger quantities within the uterus, has been thoroughly dealt with in previous articles in Veterinary Medicine and Dr. DeVine's minute, most excellent and unsurpassed reports on this subject do not require any comment.

Since we are dealing with an advanced, special form of a post-partum, or probably post-abortum, chronic endometritis, there can be no doubt left as to the origin of the trouble pointing to some source of infection. A more difficult problem regarding the causes is confronting us where young heifers are concerned. Although the assumption of an early and unobserved abortion is quite justified there are undoubtedly cases in existence where what may be termed a virgin uterus is affected. And here again an infection through the natural channels, per vaginam and per os uteri, during unsuccessful copulation, as the result of sodomy or sadism or from any unknown cause, might have to be taken into consideration, were it not that in, I presume I am safe to state, the large majority of cases of chronic endometritis, pathological conditions of one or of both ovaries and in addition occasionally of one or of both oviducts may be detected when these organs are palpated per rectum.

Which is the primary affection? A controversy arises at once which I am very, very far from entering into. Suffice it to state that during our practical training in sterility work in Switzerland our whole attention in treating chronic endometritis including pyometra cases, with a few exceptions, had been directed towards correcting the pathological conditions of the ovaries followed by uterus-massage per rectum, and eliminating uterus-irrigations altogether.

It was decided to carry out a similar line of treatment in the following case which came under my observation in September, 1923, and which may serve as an illustration:

Subject: Grade Shorthorn cow, 6 years old, in fine condition, good milker. Had given birth to a strong, healthy calf in March, 1923, the afterbirth having been removed by an empiric two days afterwards. She had been doing very well since. About the middle of July it was noticed that her tail appeared to be continually soiled with a thick, white, cream-like, odorless discharge which seemed to flow from the vagina at intervals. The owner stated that no estrum had been observed since the last parturition nor did the cow have any occasion whatsoever to "intra matrimonium vivere."

Examination: A manual exploration per vaginam on the 4th of September, 1923, showed the vagina containing several handsful of the above-mentioned discharge and the os uteri open sufficiently to introduce the middle finger without difficulty. Examination per rectum revealed the uterus considerably enlarged, roughly estimated about from 12 to 14 inches in diameter, and floating on the median line. The uterine wall appeared to be rather flabby, slightly thickened and easily yielding to pressure, at which procedure the discharge from the vagina increased.

Diagnosis: Pyometra.

Treatment: A large corpus luteum firmly attached to the right ovary, could not be dislodged with pressure through the rectal nor the vaginal wall in spite of persistent, though very cautious, efforts. A prolonged massage of both ovaries, the left one being normal, and of the uterus per rectum, was carried out and then the case was left alone till the 10th of September. The condition of the cow had not changed a particle, but the corpus luteum could be dislodged with very little difficulty then. No ovarian hemorrhage could be felt through the rectal wall and in order not to incite any, massage was omitted. The case was left again with instructions to the owner to keep the cow under close observation during the next three days and to watch developments.

On the 13th of September, a phone message stated that on that particular morning a "whole pailful of pus" had been discovered in the gutter behind the cow. On the 8th of October I examined her again and found

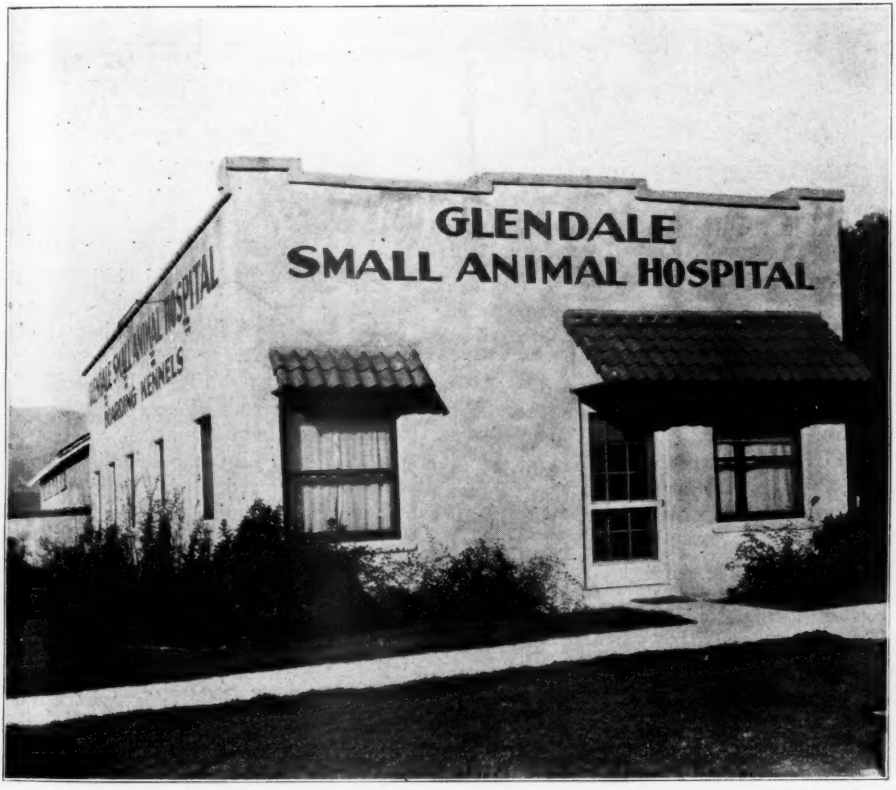
the uterus and both ovaries to be normal, the owner stating that the discharge from the vagina had ceased after the 13th of September and that the cow had been in heat a few days previous to my visit. He was advised to breed her. A healthy calf was born in 1924 and again in 1925.

It has been our experience that wherever a corpus luteum could be dislodged, a sudden expulsion of the whole contents of the uterus, as a rule within the next three days, took place followed by normal ovulation and successful conception. Be it understood, however, that it is the exception which makes the rule.

I might also state here that in many simple cases of chronic endometritis nothing but ovary treatment, such as dislodging corpora lutea, crushing cysts, massages without touching the uterine cavity at all have given us excellent results. We chose a thorough massage of the ovaries where the above pathological conditions could not be corrected without endangering rectal or vaginal structures, and eventually accomplished these little operations easily later on. The cases in which Albrechtsen's methods had to be resorted to, were very much in the minority.

C. H. Grunert

Ft. Saskatchewan, Alberta



Glendale Small Animal Hospital, Glendale, Cal., owned and conducted by Dr. G. W. Blanche, who formerly was in practice at Belle Plaine, Iowa, for eighteen years. He later located in California and a little over a year ago constructed this modern hospital, which he states he expects to enlarge in the near future. Dr. Blanche is also owner of the Glendale Veterinary Supply Co., which jobs Ft. Dodge Serum Co. products.

HOW TO GIVE A DOG CASTOR OIL

It should be of interest, especially to some of the younger practitioners, to know how to give a dog a dose of castor oil. I had graduated and been in the field many years before I learned how to give it effectually with ease.

Grasp the dog by the muzzle with the left hand, elevate his nose and with the bottle of castor oil in the right hand, simply pour from the bottle letting the oil strike the dog's nose by way of that little groove. As the oil touches this sensitive part of the dog, he immediately starts to lick it in without objection, and the entire contents of the bottle may be poured down if one wishes, with the greatest ease. We know that a dog objects to having his mouth forced open and medicines poured down his throat, but he does not object to taking oil by the method described.

Mark White, M. D., V. M. D.
Tower Bldg., Chicago

DIGESTIVE DISTURBANCE IN DOG

I have a French bulldog, four and one-half years old. He appears to have a chronic bronchitis, or such is my diagnosis. He also has a rather weak heart, but his appetite is wonderful and he will eat anything. He vomits anywhere from seven to fifteen times daily—a thick, ropy froth at times and on other occasions the vomitus may be food which has been taken several hours previously. Later there will be a watery deposit, then the froth again. I treated him for stomach trouble, also for tapeworm, with slight benefit. After getting about a thirty-foot worm from him, he stopped the vomiting for a few hours, but now has been doing it again for about a month.—E. W. V.

Reply: The cause of the cough is perhaps due to gastric irritation. If he does not stop coughing when his digestion improves, then and not till then, give him three grain tablets of ammonium chlorid, one grain, three or four times daily. If the cause is due to bronchitis, that should rather promptly relieve it. If it has existed for some time, it might require a week to effect improvement. As for the gastric condition, which should be treated first, it would be advisable to put the dog on a strictly limited diet, principally or exclusively of raw meat. Fresh hamburger steak, to which has been added about one-third its volume of tallow (suet) would be best. Along with this, given some triple arsenates (iron, quinin and strychnin arsenates). Parke, Davis & Co. and the Abbott Laboratories put up tablets of a suitable size. Give the triple arsenates at the time you give the meat, you can give doses up to 1/60th of a grain of strychnin, which would be the maximum, and you can possibly get as good results with half that amount. In stimulating his digestion, this will, of course, increase the dog's appetite, and on a limited diet, you will have to watch him very carefully to keep him out of garbage cans.

THE EFFICACY OF THE SINGLE INJECTION METHOD OF VACCINATING DOGS AGAINST RABIES

Since the single injection method of vaccinating dogs against rabies is being used rather extensively, veterinarians are often called upon to offer professional advice as to the efficacy and practicability of this method of vaccination, especially to members of local boards of health and other officials contemplating the enforcement of control measures during rabies epidemics. The following facts will no doubt be of interest in this connection.

In 1921 two Japanese scientists, Umeno and Doi, reported their single injection method of vaccinating dogs against rabies. According to their statement, out of 31,307 dogs vaccinated in an effort to control the spread of rabies in two provinces in Japan, only two developed rabies later. Hata, another Japanese worker, summarizing the results of this method of vaccination stated that only 41 of 104,629 vaccinated dogs developed rabies, while in the same territory 1,669 unvaccinated dogs developed the disease. Subsequently, Kondo working along similar lines with an attenuated vaccine, reported that 4 dogs developed rabies out of 20,117 vaccinated, and these 4 cases had been exposed prior to treatment.

In America, Eichorn and Lyon found that 5 cc of an attenuated vaccine made according to Umeno and Doi's method, protected dogs against intraocular injections of street virus. Reichel and Schneider also showed that a single injection of vaccine would protect dogs against intraocular infection. Corwin in Connecticut has reported that out of 4,000 dogs vaccinated, six were bitten later by known rabid dogs, but none of them developed rabies.

In Detroit, Dr. F. M. Meader, of the Department of Health, reported 12,918 dogs vaccinated (May 1, 1924 to May 27, 1925), while 34,164 dogs were not vaccinated. Out of the 12,918 vaccinated dogs only six developed rabies later, while 200 of the unvaccinated dogs contracted the disease. In other words, the incidence of rabies was nearly 14 times as great among the unvaccinated as among the vaccinated dogs.

Further immunity tests were recently made by the Research Department of Parke, Davis & Company* in which a number of dogs (30) were immunized with 5 cc of dead vaccine virus and held under observation for 25 days following injection to allow maximum immunity to develop.

After this time, five of the dogs were inoculated intracranially with a dose of 0.01 cc of fixed virus which proved, prior to the experiment, to be of such virulence that a 1:100 suspension produced paralysis and death from rabies in rabbits between the seventh and eighth day after subdural injection. All five of these dogs remained healthy for at least sixty days, after which time they were destroyed, while one unvaccinated dog used as a control died of rabies in seven days.

The remainder of these thirty immunized dogs were also inoculated with varying doses of virus, from 0.01 to 0.5 cc. In some cases where 0.05 cc or more of the virus was given the animals, the results were somewhat variable, but three dogs received as much as 2 cc of the virus without developing rabies. However, rabies did not develop in any of the dogs receiving less than 0.05 cc of virus, although unvaccinated control dogs receiving a like amount of virus all died of the disease in 7 and 8 days.

The results of this experiment show quite conclusively that 5 cc of a single injection of a dead virus vaccine will produce sufficient immunity to protect against ordinary, and oftentimes extraordinary natural infection, and can be recommended as a means of controlling rabies in dogs that have not been exposed to rabies.

G. W. Rawson, D. V. M.
Detroit, Mich.

*"Prophylactic Immunization of Dogs against Rabies by a single Injection of a Dead Virus Vaccine" by A. S. Schlingman (Jour. A.V.M.A., December, 1925, Page 299).

LAY VERSUS PROFESSIONAL HOG CHOLERA IMMUNIZATION

We note in the March number of Veterinary Medicine a quotation from our annual report of 1925, showing the difference in the number of hogs saved when treatment was administered by veterinarians and by laymen. In this regard, you are advised that in 1925 there was less difference between the number of hogs saved by laymen and veterinarians than for any year since these records were kept.

We have figured out a six-year average which we think is most interesting. During this time laymen treated 4,158 hogs while veterinarians treated 14,765.

Per cent that survived treated by laymen ..... 64.
Per cent that survived treated by veterinarians 76.5
Per cent that survived that were apparently well when treated by veterinarians ..... 92.
Per cent that survived that were apparently well when treated by laymen ..... 81.
Per cent that survived that were sick when treated by veterinarians ..... 35.
Per cent that survived that were sick when treated by laymen ..... 25.

This shows that for every 100 hogs treated by veterinarians as compared with the same number treated by laymen, 12.5 more were saved by professional services as contrasted with lay immunization. During these six years, the average value of

hogs as shown by the U. S. Department of Agriculture has been $13.44 per head. On this basis, veterinary service represents a saving over lay vaccination for the six-year period of $168.00 for every 100 hogs treated.

It is probable that there are some persons who will wonder why we have lay vaccination in Maryland. In this connection, it must be stated that we have nine counties in which there are no veterinarians, and it is necessary for laymen to treat their own hogs or lose all of them. However, laymen in Maryland are not permitted to administer the double treatment to their swine.

I. K. Atherton,
B. A. I. Inspector in Charge
of Hog Cholera Work.
College Park, Md.

DEER THOUGHT TO BE FREE OF FOOT-AND-MOUTH DISEASE

The eradication of foot-and-mouth disease among deer in California is apparently complete, says the United States Department of Agriculture. During the 1924 outbreak of the disease among domestic animals in that State the infection reached deer in the Stanislaus National Forest. At that time many persons considered efforts to eradicate so virulent a disease from wild deer on the open range would be futile.

In undertaking the task Federal and State authorities faced a new problem, which was further complicated by public sentiment both for and against the destruction of the deer. But consideration for the safety both of domestic animals and of wild life resulted in the official decision to reduce the number of deer in the limited area infected, thereby preventing the disease from taking a heavy toll later over large areas.

The systematic campaign of hunting deer in the infected area has apparently stamped out the disease, as no case of infection has been observed since June 10. Since the disease had been eradicated from domestic animals in California several months earlier the eradication of it from the deer finished a very difficult veterinary task.

ANSWERS TO KINSLEY'S QUERIES ON HORSE PRACTICE

1. What is an effective method of breaking a horse or mule of halter pulling?

Fix a stout rope of good length as if for a lariat. Place the slip loop around the body of the horse, letting the end come between the forelegs through the ring in the manger back to the ring in the halter. See that everything is firm and will not break. Let the horse pull until he gives up, then encourage pulling until he absolutely refuses to do so. If the lesson has been thorough, there will be no future trouble.

2. How can a mare be tied so that her young foal will not get hung in the halter ring?

Place the mare in a nice, comfortable box stall and leave the halter off her.

3. Is there a simple, inexpensive, effective method of breaking a horse of kicking while hitched?

This habit can be cured so that a fearless horseman will have no trouble, but if the animal is handled by a timid or nervous man, the habit will soon be taken up again. Use the halter and tail or second form of war bridle treatment. Use a thorough course of training, and the horse can soon be broken from this vice. This habit cannot be successfully cured by whip or club treatment.

4. What does a horseman mean when he states that a certain horse is "a cold collar"?

This term is applied to a horse that is just a trifle balky, not a real balker, but one that is just a little sticky. The term "collar proud" is sometimes used to describe this habit.

5. What is the cause and treatment of chest founder?

There is no such animal. This is an atrophied condition of the muscles of the breast resulting from a long standing case of chronic laminitis. No cure.

6. Is "cross firing" a serious defect in a harness horse?

Due to faulty gait. If the animal goes clean when barefooted and cross fires

when shod, the horse is not properly balanced. He can be shod to overcome this fault, unless he has continued to do so so long that he has formed the habit of going "crab gaited." If he has reached this stage, the habit is a defect.

7. **Is there an effective method of overcoming a lugger?**

Yes, unless the horse is a cold jawed one or a dummy. He can then be bridled to offset it but cannot be broken from the vice.

8. **What is meant by the phrase, "smokes his pipe"?**

A term applied to a horse that has had his lips cut at the mouth corners until his lower lip drops a little or the abrasion is deep enough to cause the animal to drool when the bit is in place in the mouth.

9. **Is there any method of shoeing that will effectively overcome winging?**

This is a condition where the animal in traveling goes exactly opposite to conditions that must be present to have perfect balance. It can be helped by shoeing but cannot be fully overcome owing to the opposition to nature. In winging the animal breaks off to the inside toe and also stands toed in while at rest. A horse's foot always points to the highest place. The foot leaves the ground as it strikes it in motion. By raising the outside toe, the horse can be made to toe out or to the center instead of toeing in. By raising the outside, one also encourages breaking over to the inside. Sometimes by shoeing with a very light shoe with the outside slightly raised, a grap placed on the inside well up towards the toe and the toe of the shoe extending well out and squared, this fault may be lessened. A winger also has excessive knee action, and as one lengthens the toe or lowers the heel, one encourages knee action, making another opposition as knee action should be discouraged in winging. For this same reason, heel weights which have a tendency to correct winging also add to knee action making another opposition.

10. **What is the cause and treatment of tongue lolling?**

This is a habit usually started from sharp lower molars. If taken before the habit is formed, the condition can be remedied by careful dressing of the teeth. One will also find tongue lolling in dummies. It also follows injury or partial paralysis of the tongue. About the only remedy I have found any way successful in this condition is to tie the tongue and strap the mouth when in harness.

E. E. Burdick

Huron, S. D.

ABSTRACTS OF RECENT LITERATURE OF INTEREST TO POULTRY PRACTITIONERS

Ascaridia Lineata, a Parasite of Chickens in the United States. By Benjamin Schwartz. Journal of Agricultural Research: V. XXX, P. 763, 1925.

Heretofore it has been assumed that the large intestinal round worm of chickens in the United States is Ascaridia perspicillum. A recent study of specimens of Ascaridia from chickens in various parts of the United States has shown that the species in question does not conform to the description of Ascaridia perspicillum, as given by various writers, but conforms in practically all respects to the description of another species, namely, Ascaridia lineata, which was described by Schneider in 1866.

Confusion of the two species is probably due to, their close relationship, the tendency of most workers to make host determinations and the fact that the Ascaridia perspicillum is an earlier European described species while Ascaridia lineata was originally described from Brazil and has been given less attention. The number and arrangement of papillae on the tail of the male forms the chief method of differentiation. The number and pattern of papillae found on Ascaridia occurring in American chicks conform to that of Ascaridia lineata rather than Ascaridia perspicillum.

The occurrence of Ascaridia lineata is recorded for the first time as occurring in a goose, found in a specimen from Indo-China.

IOWA STATE AGRICULTURAL COLL... MAR 30 1926

The Responsibility of Veterinary Science to Poultry Husbandry. By James E. Rice. The Cornell Veterinarian: V. XV, P. 251.

"The demand for medical science and practice as applied to poultry will continue with the increase in human population. Poultry is the only class of domestic animal which increases in numbers as the country increases in population. The poultry industry is large enough to command attention of the veterinary profession.

"Poultry is the most widely distributed of any kind of livestock except work horses and with the growing popularity of tractors and trucks, poultry is likely to take first place. The last census showed that 91 per cent of the farmers in the U. S. and in New York State kept poultry."

"How rapidly poultry husbandry is advancing as a successful commercial industry is shown in the graph showing the estimated progress which has been made by decades since 1880, as measured by the size of successful poultry farms. Progress in the development has been and is due in large degree to the elimination of hazards as a result of the discoveries of science. There is much yet to be accomplished by trained investigators. How great the present need is perhaps can be judged by the extent to which numerous proprietary medicines are filling advertising space with their claims and the pockets of the advertisers with the poultrymen's money.

"The loss to poultrymen on account of diseases, parasites, natural enemies, and other causes from mortality is not far from 10 per cent of the total adult poultry population and at least 25 per cent of the young hatched each year to replenish the flock. Just how much of this mortality is due to preventable or curable diseases it is difficult to estimate and no accurate statistics for the country as a whole are available. It seems fair to assume that at least one-half of the total losses are due to diseases and parasites. A further loss of large importance is due to the lower production and less efficient growth of poultry due to the ravages of diseases and parasites. The losses of this character though less conspicuous or apparent may be as large in the aggregate as the losses due to mortality.

"Among the most serious poultry diseases in this country considering their fatality and wide distribution may be mentioned, roup, canker, chicken pox, worms, and tuberculosis, all of which are largely preventable by proper methods of sanitation and management. With the increase in the size of poultry flocks and farms comes a larger demand for the services of trained veterinarians. Outbreaks of chicken pox call for vaccination. The eradication of white diarrhea calls for the agglutination test. Tuberculosis, fowl typhoid, the European plague, aspergillosis, and similar diseases, call for the diagnosis and personal attention of a veterinarian."

* * * * *

Induced and Natural Transmission of Blackhead in the Absence of Heterakis. By E. E. Tyzzer and J. Collier. Journal of Infectious Diseases: V. 37, P. 265. 1925.

Summary

No case of blackhead has developed in large numbers of incubator hatched turkeys kept in clean compartments and fed on sterilized food, so that there is no indication that the infection is transmitted through the egg.

Turkeys reared under such conditions remain free from intestinal amebae and flagellates for long periods.

The early appearance of coccidiosis under conditions of strict isolation indicates that the coccidium of the turkey is transmitted either through the turkey's egg or on the shell of the latter.

Blackhead of the type which occurs naturally may result from feeding material from active liver lesions but is produced more regularly by the injection of such material.

The passage of the blackhead protozoon into the turkey's cecum in sufficient numbers for it to become established appears to be the only condition necessary for the invasion of the tissues in young turkeys, so that lowered resistance and local injury are without etiologic significance.

It is apparent from the present experiments that the blackhead protozoon is dis-

charged from acutely infected turkeys in a form which is capable of producing infection if ingested at once, but which persists for only a short time outside the body.

The possibility of the direct transmission of the disease from infected to healthy stock indicates the importance of the isolation of the former.

* * * * *

At the eighty-second meeting of the American Association for the Advancement of Science, at Kansas City, held December 28, 1925, to January 2, 1926, several interesting papers regarding poultry were presented.

Papers on round worms in chickens by Achert, Herrick and others brought out many interesting points.

In a study on the "Effect of Repeated Bleeding upon the Resistance of Chickens to Parasitism," Achert showed that it required a considerable amount of bleeding to materially reduce resistance to parasitism. In young chicks amounts as great as five cubic centimeters every four days were drawn from the chick's heart before a noticeable increase in number of ascaridia was noted. The withdrawal of greater quantities of blood markedly lowered the resistance of the bird so that more and longer ascarids were found.

It was the consensus of opinion among the workers present that ascarids infest the chickens and cause the greatest damage before the chick is three months old. Ascaris eggs do not hatch or develop successfully in old birds. A natural resistance seems to develop in the birds. The ascaris embryo, after emerging from the shell, develops between the villi and in the submucosa of the intestines. They migrate only occasionally. Evidence was introduced to show that vitamin B is important in producing resistance against ascarids in chickens. Chicks fed a ration deficient in vitamin B became hosts to more and larger worms than did chicks fed an abundance of vitamin B. This is analogous to the effect of diet on resistance to hookworm infestation in humans. It has been observed that a certain number of hookworms will cause no disturbance in persons on a liberal, well balanced diet, while the same number of hookworms in persons poorly fed caused marked symptoms.

It would be well for all veterinarians to bear this in mind when advising anthelmintic treatment.

Dr. Hall reported that he had found kamala in one gram doses to be very effective as a teniacide in poultry. He has the drug prepared in half-gram pills and gives two pills to each individual. In five cases all tapeworms were removed, in five cases part of the worms were removed, in one case none were removed. The cost is less than one cent per bird. Individual treatment is much more effective and satisfactory than flock treatment.

Sivert Eriksen

Mountain Grove, Mo.

REMEDY FOUND FOR TAPEWORMS IN POULTRY

Kamala, a brownish powder obtained from a plant in India and long used there as a drug, has been found satisfactory for removing tapeworms from poultry. This announcement is made by the United States Department of Agriculture as a result of experiments carried on by Dr. Maurice C. Hall and Dr. J. E. Shillinger of the Zoological Division, Bureau of Animal Industry.

Tapeworms cause serious disturbances in chickens, turkeys and other poultry, the injuries ranging from unthriftiness to conditions simulating paralysis, due to deficient diet, sometimes resulting in death. Up to the present time no satisfactory treatment had been known. The demand for a remedy has been insistent and was considered the more urgent in that the life histories of so many tapeworms are unknown that satisfactory preventive measures can not be recommended as yet. Moreover, so far as life histories are known they involve such intermediate hosts as flies, earthworms, slugs, and similar animals which are themselves difficult to control under farm conditions. The need for such a drug as kamala is therefore apparent.

The drug was tried out on 120 chickens and 6 turkeys, counts being made daily of the tapeworms removed, the birds finally being killed to determine whether any of the parasites were left. The result indicated

that a dose of one gram to a chicken removed all the worms in approximately 19 cases out of 20, a much better result than has been secured with any other drug. The dose for turkeys seems to be 2 grams.

The investigators say the best method of administration appears to be individual dosing with pills, but that the use of capsules is also satisfactory. Flock dosing by the administration of the drug in feed is much less satisfactory. The dosing of individual birds is easily accomplished and fasting and purgatives do not appear to be important. At the present time it may not be possible to obtain kamala at all drug stores, but it is thought that within a short time manufacturers will have it on the market in convenient form. An estimate of the cost of the kamala itself for treatment of chickens is less than one cent per bird.

OTITIS—A CAUSE OF "WRYNECK"

In many cases of fowls showing symptoms of so-called "wryneck," inflammation of the various structures of the middle and internal ear has been the apparent cause. The bird usually twists its head to one side, making a jerky motion as it pulls its head back. Sometimes the head is first turned downward and then up to one side. At other times the head is twisted over the wing and back. When left alone the patient will often be able to straighten its neck long enough to eat and drink. The appetite is usually good.

Autopsy of these cases yielded nothing of etiologic significance until it occured to us to examine the ear and surrounding structures more carefully. Since then we have practically always found the cause to be a purulent inflammation of some structure involving the nerves of the ear. In some cases hard caseous pus has been found in the middle ear, in others active purulent inflammation of all the ear structures. In a few cases we have found inflammation of the bones surrounding the auricular nerves.

Treatment in our experience has been unsuccessful. Experimental puncture of the ear drums of healthy birds has not produced untoward symptoms.—Sivert Eriksen, Mo., State Poultry Experiment Station.

MEETING OF THE IOWA VETERINARY MEDICAL ASSOCIATION

Iowa meetings have a reputation for being always good, but the 1926 meeting held in Des Moines, February 2-4, was described generally as the greatest meeting of the association. Including the visitors and ladies, there were approximately 500 in attendance. The meeting room was filled most of the time and appreciation was otherwise expressed for the program and the excellent way the contributors handled their subjects, many of the numbers being illustrated by slides and motion pictures. Thirty-five new members were taken in, which makes the membership practically 500. There were 28 ladies present and they said they enjoyed this first meeting at which a ladies' program was provided; so this will probably be a regular feature of Iowa meetings in the future.

The first morning the President's address started the meeting with its clear analysis of the veterinary situation which he described as optimistic with proper attention to the needs of the profession along the line of cooperation from all branches of the profession especially with the practitioner, complete organization of the state, through qualification of veterinarians to handle all lines of work presented and then publicity of the service they are able to offer the live stock industry.

The proposed changes in the constitution and by-laws and code of ethics proved interesting, especially the sections on raising the dues and the change in the code of ethics on advertising. The dues were raised to $3.00 for in spite of the large membership the association could not function best for the membership with the dues at $2.00. The association pays the expenses of officers and committees while engaged on special trips in the interest of the association, which was considered well worth while to secure the service of those who are willing to give their time for the good of the profession.

The change adopted dealing with advertising is as follows:— "In advertising,

the veterinarian shall confine himself to his business address in newspapers, on cards or stationery, and to such other advertising or publicity of an educational nature intended to inform the public of veterinary service without advertising prices of fees for medicines or services. He shall not use the title 'assistant state veterinarian' or 'accredited veterinarian' except in signing official papers, such as health certificates. He shall not advertise as 'specialist', but may advertise 'practice confined to' the treatment of certain diseases or animals."

The Executive Committee, cooperating with a special committee on publicity, will also put into operation a plan of publicity for the profession as well as censor any material submitted for approval before given publicity by a member and handle complaints of violations of the new and more liberal code of ethics on advertising. The idea of paid publicity was regarded as something the association should go slow in adopting from the standpoint of ethics. A special assessment of $1.00 was made to start the raising of funds to carry out some of the plans of the publicity committee.

After the changes in the constitution and by-laws and code of ethics were adopted, a motion was adopted that the association incorporate. To do this, all that is required in Iowa for a non-profit organization is to file the copy of the constitution and by-laws and code of ethics with the county recorder and where the association's headquarters are located. These with the application to the court, prepared by an attorney, constitute the articles of incorporation. The liability of members for the acts of the association is thus limited and only the association funds are affected by legal action, should the association be sued.

The program started the afternoon of the first day by an "Illustrated Lecture and Question Box on Small Animal Practice" by Dr. J. C. Flynn of Kansas City, which occupied almost two hours and was thoroughly enjoyed. "Rabies in Iowa" then was discussed by Dr. D. M. Griswold, State Commissioner of Health, who advocated state-wide control and favored state-wide vaccination of dogs due to the traveling habits of infected animals and to the long period of incubation of the disease sometimes. Next, Dr. E. M. Nighbert, who is in charge of some B.A.I. experiments with sheep at Queen City, Mo., gave a very instructive and practical talk on "General Sheep Practice". Finally, Dr. R. C. Moore of St. Joseph, Mo., who was for many years professor of surgery at the K. C. Veterinary College and at the St. Joseph Veterinary College later, illustrated the anatomy of the udder and discussed "Surgical Treatment of Diseases of the Udder of Cattle". To remove new growths from the teat canal and bottom of the milk cistern, he advocated the slitting of the end of the teat about half an inch, or through the sphincter and skin also, and then removing the tumors with scissors, leaving the wound in the end of the teat open for drainage which heals readily with little after-care.

The next morning, the program began with an illustrated description of "The Abdominal Viscera of the Ox" by Dr. G. W. McNutt of the Iowa State Veterinary College. Numerous slides showed the relations of the organs and their locations were pointed out from the standpoint of diseases in a very instructive way. Then Dr. F. E. Walsh, also of the College, read a splendid paper on "Common Disorders of the Digestive Tract of Cattle" in which he reviewed his experiences with the various drugs used and reported some experimental work on barium chlorid. Next, Dr. L. P. Scott of Waterloo, Iowa, presented a very practical paper on "The Use of the Stomach Tube in General Practice." Completing the morning program, Dr. C. E. Golden, a federal inspector at Sioux City, gave an illustrated review of the outbreaks of foot-and-mouth disease as he had seen them in California and Texas, giving special attention to differential diagnosis.

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The afternoon of the second day was devoted to discussion of tuberculosis. First, a paper by Dr. R. A. Moye, County Inspector in Charge at Manchester, Iowa, entitled "Tuberculosis Eradication," dealt with particularly cooperation from the owner in buying new cattle and in cleaning and disinfecting. Then, Dr. J. A. Barger, U. S. Inspector in Charge in Iowa, gave a very good extemporaneous talk on "Why Tuberculosis is Being Eradicated". Next, Dr. P. Malcolm, Chief of the Iowa Bureau of Animal Industry, presented a paper on "The Non-Reacting Tuberculous Cow", which dealt with means of detecting tuberculous animals other than the test only. Then an illustrated lecture on "Tuberculous Skin Lesions in Cattle" by L. Enos Day, U. S. Inspector in Chicago, showed how cattle contract skin lesions and also showed pictures of the lesions before and after slaughter. Following Dr. Day's address, Dr. R. Graham of the University of Illinois, presented an illustrated discussion of the relation of avian tuberculosis to tuberculosis of pigs and calves, which was very interesting and recent work. Finally, Secretary M. G. Thornburg of the Iowa Department of Agriculture, presented a report on "Veterinary Activities of the Department of Agriculture."

One of the outstanding things in Secretary Thornburg's report was the statement that 230 practitioners during the year had tested 634,230 cattle and had been paid $122,365.00. This means that they had averaged 2,757 cattle tested, had received $532.00 each on an average, and had tested cattle at a cost, according to these figures, of 19c per head. The plan of using practitioners in Iowa has been worked out with the Department of Agriculture and the federal office through numerous conferences with association officers and it shows how satisfactory it has been when 230 of approximately 350 practitioners in the 52 counties have taken advantage of the privilege extended them. Practitioners testing in their immediate communities receive $10.00 per day and 7c per mile with tags and tuberculin furnished. They are not required to work more than two days of a week if they can't spare more time for any special reason, which would mean one day injection and one day reading. An efficiency record is kept of every man's work and practitioners are required to test as many cattle as full time inspectors working under similar conditions. The state records show there is little or no difference, and the plan of using practitioners, with their valuable local influence, in conjunction with a full time county inspector in charge, has proved highly satisfactory. The Iowa law has helped in making rapid progress in area work and in the use of practitioners, for the counties which make a levy, adopt the plan, and this is added to state and federal funds. Thus different counties with different percentages of reactors may carry on the work as rapidly as desired with available veterinarians. The use of practitioners gives elasticity to the employment of inspectors by the state, for they can be used only as funds permit, and practitioners by being made a part of the movement, may have considerable influence both in assisting in having the plan adopted and in securing necessary funds to carry on the work as rapidly as possible.

The evening of the second day of the meeting, a banquet and program in connection with it were held to which representatives of the agricultural press and Iowa live stock organizations were invited as guests. These banquets and programs have proved very popular, for 315 were present. They have added considerably to the prestige of the profession in the state as well as being very encouraging to the members of the association. Last year we had 100 members of the legislature with us and next year we shall probably have them with us again as well as others such as representatives of the press, live stock organizations, etc. Along this line, a movement has been started to organize an Iowa State Breeders Association and the Iowa Veterinary

Medical Association has been invited to be one of the units. At these banquet occasions, we have asked for nothing, but have simply tried to point out the value of veterinary service to the live stock industry and to the public in an educational and interesting way. To get out our guests, we have found that the association as an organization can best do that rather than leave it to individual members to do, and the complimentary tickets have been paid for out of the treasury. By cooperation of all the veterinary agencies of the state such as the department of agriculture, the federal force, the State Veterinary College and the practitioners, these occasions, we feel, can be made one of the greatest agencies for good the profession can use and a form of publicity of the highest ethical type.

The first speaker on the banquet program, Mr. Royal R. Holbrook of the Iowa Engineering Extension Department, in a very humourous and interesting manner, as a rapid-fire orator, told why Iowa is the greatest state in the Union and why its resources make it a great live stock center. "The largest piece of productive soil in all the world!"

Then Mr. Wilbur W. Marsh, Guernsey breeder of Waterloo, Iowa, spoke on "The Live Stock Industry and the Veterinary Profession", pointing out the economic situation of developing the pure-bred live stock business and how an efficient veterinary profession was necessary to a program of making Iowa one of the foremost centers of the world for the live stock industry. His remarks, given in a sincere and eloquent manner, certainly were encouraging. Mr. Marsh is one of the most successful breeders in America and has been given the honor of being the first "Master Breeder," an honor accorded by the National Dairy Association. He promised the support of the breeders of Iowa in securing more recognition of the profession, higher standards of veterinary practice and opportunity for post-graduate study and research on animal diseases. He also condemned tendencies toward discouraging the practitioner or lowering the standard of veterinary service in any way. Veterinary service, he said, was a business matter and a necessity, a form of live stock insurance vital to successful agriculture.

The next speaker was Mr. John Thompson of the Iowa Homestead, who discussed "The Agricultural Press and the Veterinary Profession." He pointed out methods through which the agricultural press and the profession of the state could cooperate for the benefit of the live stock industry and he dealt in particular with the ways veterinarians could advise their clients along the line of care and feeding of live stock.

Following his discussion, Dr. R. Graham of the University of Illinois gave an illustrated talk on "Organizing a Bureau of Animal Industry in Haiti." He showed how impossible it is to develop a country, especially in the live stock industry, without adequate veterinary service. His pictures illustrated the theme of the evening program, the relation of veterinary service to successful agriculture.

After the regular program, the toastmaster called on Mr. Sherman, a prominent Guernsey breeder of Charles City, Iowa, on the mayor of Sioux City, on former Senator F. Larabee of Fort Dodge and on Mr. Hogue, director of the state budget, to make a few remarks.

The whole evening was a very pleasant entertaining occasion. Toastmaster Dr. H. D. Bergman, introduced the speakers in a humorous and apt manner. To start the evening, during the eating, the LaBoheme Trio, assisted by Miss Vivian Cox in fancy dancing and Miss Inez Uhl and William Martindale in Charleston dancing, entertained the banqueters. After the program, Dr. E. M. Nighbert dismissed the audience with one of his famous possum hunts.

The morning of the last day of the meeting the program was started by an

interesting "Report on Experiments in the Vaccination of Poultry" by Dr. S. H. McNutt of the Iowa State Veterinary College. Then a group of practitioners discussed their methods of poultry practice. They were Dr. F. J. Crow, Dr. Irving Moles, Dr. L. P. Miller and Dr. R. C. Mills. Following this discussion, Dr. R. Graham described the plan in Illinois for accrediting flocks as free from tuberculosis and white diarrhea, in which the practitioners do this work and have charge of the accreditation under state supervision. Next, Dr. H. E. Biester of the Iowa State Veterinary College presented an illustrated discussion of "The Pathology of Infectious Enteritis of Swine" which was of considerable interest due to the importance this condition is assuming. The illustrations were very good and were well presented. Then Dr. A. C. Drach of Omaha presented a paper on "Swine Immunization Sanitation" which dealt thoroughly with the importance of the proper handling of swine at time of vaccination and of careful technic in doing the work.

In the afternoon, a group of splendid papers on genital diseases was presented as follows:— "The Practitioner and the Abortion Problem", by Dr. John B. Bryant, Mount Vernon, Ia.: "The Oestrus Cycle of the Mare" by Dr. W. A. Aitkin of the College; "Further Studies of Ovarian Extracts in Sterility" by Drs. H. S. Murphey and B. F. Zupp also of the College.

A business session was then held. The Legislative Committee reported there had been no anti-veterinary legislation, which was rather a relief. The Veterinary Lien Bill had been lost in the fight which developed over the gasoline and highway bills, although it had received favorable action up to that time. The association extended to Secretary Thornburg thanks and appreciation for the consideration shown the profession in tuberculosis work and in prosecution of the violations of the practice act and serum and virus law. It has been found that an injunction clause is needed to restrain violators of the practice act after they have been fined, so that they may be checked from further violations. A favorable opinion had been secured from the attorney general's office stating in effect that the taking of commissions constituted the same as a fee for practice when peddlers sold remedies and administered them. The prosecution of some of these numerous new styled quacks, making them pay for losses incurred, will help check this evil. Other problems such as lay vaccination and activities of the Extension Department were discussed, with the situation optimistic. The newly elected officers were president, Dr. J. S. Potter, Iowa City; first vice-president, Dr. J. W. Haxby, Clarinda; second vice-president, Dr. F. B. Young, Waukee; executive committee, Dr. C. J. Scott, Knoxville. Secretary-Treasurer, E. R. Steel, was reelected.

E. R. Steel, Sec.-Treas.

SHEEP MAY BE CARRIED ALL SUMMER ON FORAGE CROP

Use of forage crops for pasturing sheep in summer is a practical means of feeding them, according to the results of experiments conducted by the United States Department of Agriculture on its experiment farm at Beltsville, Md. Observations were made not only of the gains in weight but also of the general condition of the animals, including resistance to disease and parasites.

The crops used in this system of pastures in the order of use were as follows: Fall-sown rye, wheat, winter barley, oats, and Canada field peas, soy beans, corn and velvet beans, fall-sown winter barley, and winter wheat.

It was shown that sheep can be raised successfully by using such crops as cow-peas, soy beans, and like plants to provide the entire summer pasturage. The method was beneficial also in the control of stomach worms and other internal parasites. By the method lambs can be grown to market weights without being visibly affected by parasite infestation. A frequent rotation of pasture made possible by this system is beneficial, but not entirely adequate, in controll-

ing parasites of sheep carried on the farm throughout the year.

ANNUAL SESSION, WISCONSIN VETERINARY MEDICAL ASSOCIATION.

Madison, January 26th to 29th.

The session was called to order by the president. Dr. J. P. West of Madison, who in appropriate remarks outlined the aim of the association, calling attention to the few candidates who presented themselves for licenses as compared with the past.

Dr. J. C. Flynn of Kansas City then showed a film on hospitalization of small animals. During the meeting he gave lectures and demonstrations each day. He has his subjects well assembled and classified, showing that he has given much study to the treatment and handling of small animals.

Mr. D. S. Snyder, editor of The Drovers Journal, spoke on "Improving Veterinary Service." He contended that what this profession needs is intelligent, ethical advertising. He brought this to attention by defending the profession in his paper and denouncing adverse legislation ignorantly introduced in legislatures, such as permitting laymen to administer serums, viruses and vaccines. He was unstinting in his praise of the profession and gave it credit for the fact that the United States and Canada have no highly contagious animal diseases. Almost all other countries have one of the dreaded animal pests, such as foot-and-mouth disease and rinderpest, especially foot-and-mouth disease, continually. We have had a few outbreaks of foot-and-mouth disease and one of contagious pleuropneumonia, all of which have been stopped. Hog cholera has been substantially reduced; blackleg and anthrax are controlled; glanders in horses has been held in check; the "tick" has been driven from wide areas; and now the control of bovine tuberculosis is in sight. Mr. Snyder predicted a prosperous era ahead for agriculture equal to if not better than immediately following the war, because prices would be more equal.

Dr. J. S. Koen of Bloomington, Ill., discussed an article in the Journal of the A. V. M. A. by Secretary Hoskins entitled "Can the Veterinarian Sell So-called Mineral Mixtures and Maintain His Ethical Standing?" Dr. Koen took the affirmative side and maintained that veterinarians could. Several of the members also discussed the subject and thought they got beneficial results from the use of such preparations. Others were of a different view.

The University of Wisconsin cooperated under its extension division in the program and furnished many valuable numbers. W. J. Mock, Professor of Physiology, gave a very interesting lecture on endocrine glands. D. S. Steel, Assistant Professor in Genetics, demonstrated a blood test in which the sex of the subject is shown.

Dr. L. M. Roderick, Assistant Veterinarian, University of North Dakota, and a former resident of Broadhead, Wis., gave an account of tracing to badly cured sweet clover the losses in stock in many localities of his state.

L. J. Cole, Professor of Genetics, demonstrated with cattle raised at the University farm how red and white calves appear in purebred Holstein herds.

T. Macklin, Professor of Agricultural Economy, graphically showed the rapid development of the dairy industry in New Zealand, which may soon become a factor as a competitor in our markets.

L. F. Graber, Professor of Agronomy, showed the value of bacteria in alfalfa raising and finally where a celebration was held for "Miss Alfalfa" and a sadder occasion where "Old Man Timothy" was buried. It reminded us of another sad occasion in this state when Waupaca county held a public funeral over its last scrub bull.

Dr. F. B. Hadley, Professor of Veterinary Science, explained congenital defects in calves, and Dr. B. L. Warwick, Assistant in Veterinary Science, gave a lecture and demonstration on the inheritance of hernia in swine.

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The subject of poultry was given a prominent place in the program. It couldn't be otherwise as long as Dr. Beach was chairman of the program committee. Dr. Beach is no "chicken" when it comes to handling a "hen," especially her "innards." He demonstrated roundworms and tapeworms and assured us that it is up to the veterinary profession to save this industry if it is to survive the ravages of diseases and parasitic infestation. J. G. Halpin, Professor of Poultry Husbandry, showed the effects of ultra-violet rays. J. B. Hayes, Assistant Professor of Poultry Husbandry, demonstrated the use of sodium fluorid in treating lice infested poultry. H. H. Lackie of the Department of Markets, spoke on the baby chick industry of Wisconsin.

J. G. Fuller, Professor of Animal Husbandry, and F. W. Duffee, Associate Professor of Agricultural Engineering, arranged a demonstration in measuring the pulling power of horses by the dynamometer car for the benefit of the association, which was of much interest to all.

Those in attendance visited the new state hospital on Wednesday noon, and after partaking of lunch, heard Dr. C. A. Headblom, Professor of Surgery, of the medical staff, give an illustrated lecture on recent advancements in chest surgery.

Discussion of reports on outbreaks of hemorrhagic septicemia were led by Drs. G. H. Harland of Pewaukee, C. D. Lee of Iola and Chas. F. Van de Sand of Kiel. Dr. E. A. Behnke gave a report on the slaughter of reactors for the past year. Dr. J. W. Adams, President of the A. V. M. A., was expected but at the last moment telegraphed his regrets.

The banquet on Wednesday evening was well attended. The Governor spoke in place of Commissioner J. D. Jones, who was called out of the city.

Veterinarians in attendance at Wisconsin meeting.

Dr. T. Wrigglesworth of Eau Claire was elected president of the association. He is one of the oldest practitioners in the state in point of service. However, he is only a young man as yet. Dr. E. A. Garman of Tomah was elected vice-president, and Dr. W. E. Holechek of Thorp, director for the northern district, to succeed Dr. S. V. Lewis of Glenwood, whose term expired.

Many stayed over the fourth day for the clinics at Dr. West's hospital, where the following subjects were demonstrated: roarer by Dr. Abbott of Marshfield; cryptorchid (horse) by Dr. J. F. Roub of Monroe, also fistulous withers; tendenotomy (stringhalt) by Dr. J. P. West of Madison; demonstrations on dogs and cats by Dr. J. C. Flynn of Kansas City.

The association voted to meet here in Madison for the summer session in July.

Dr. Herbert Lothe of Waukesha, was elected official representative to the A. V. M. A. and Dr. R. S. Heer of Platteville, alternate.

O. H. Eliason, Sec.

Madison, Wis.